

COMMONWEALTH OF KENTUCKY OFFICE OF THE ATTORNEY GENERAL

ALBERT B. CHANDLER III
ATTORNEY GENERAL

December 30, 2003

I 024 CAPITAL CENTER DRIVE SUITE 200 FRANKFORT, KY 4060 I-8204

Thomas M. Dorman, Executive Director Public Service Commission 211 Sower Boulevard Frankfort, KY 40601

RE: Responses to Commission staff and Company data requests in In the Matter of: An Investigation Pursuant to KRS 278.260 of the Earnings Sharing Mechanism Tariff of Kentucky Utilities Company, PSC Case No. 2003-00334 and An Investigation Pursuant to KRS 278.260 of the Earnings Sharing Mechanism of Louisville Gas and Electric Company, PSC Case No. 2003-00335

Dear Mr. Dorman,

Enclosed herewith are the original and seven copies responses of the Attorney General to data request posed by Commission staff by Order dated December 15, 2003 and to data requests posed by LG&E and KU. By this letter I certify that all parties have been served with a complete and true copy of the responses with the exception of diskettes. The responses to the data request of LG&E and KU require two diskettes that have been included only in the following: the original supplied to the Commission, the copy provided to John Wolfram and to Robert Rosenberg on behalf of LG&E and KU, Mike Kurtz, Mike Laros and David Barberie.

Sincerel

Elizabeth E. Blackford Assistant Attorney General

1024 Capital Center Drive, Suite 200 Frankfort, Kentucky 40601-8204

(502) 696-5453

betsy.blackford@law.state.ky.us

ce: Mike Beer
Linda Portasik
Kendrick Riggs
John Wolfram
Mike Kurtz
Mike Laros
David Barberie



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Responses of the Attorney General's Witness Carl G. K. Weaver to Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335 Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

1. In reference to Dr. Weaver's statement at page 10, line 22 that factors other leverage affect risk, indicate the five most important other factors that affect risk.

Answer:

A discussion of risk, as it relates to the rate of return is provided in Appendix II, page 3 beginning at line 10 and continuing through page 4, line 12. As is indicated in Appendix II, page 3 on line 12, "Risk ... is caused by any phenomenon which may result in the actual future return being less than the return anticipated when the investment was made." Categories of risk are provided on lines 15 through 19, page 3, of Appendix II. Since it is caused by the occurrence of any item, some of which can be controlled or partially controlled, it is not possible to rank risk exposure. For example, the occurrence of an ice storm that effects a company's distribution is an important source of risk to a company located in an area where ice storms occur and that has dense vegetation but less important to a company located where ice storms almost never occur and where there is little vegetation.

Responses of the Attorney General's Witness Carl G. K. Weaver to

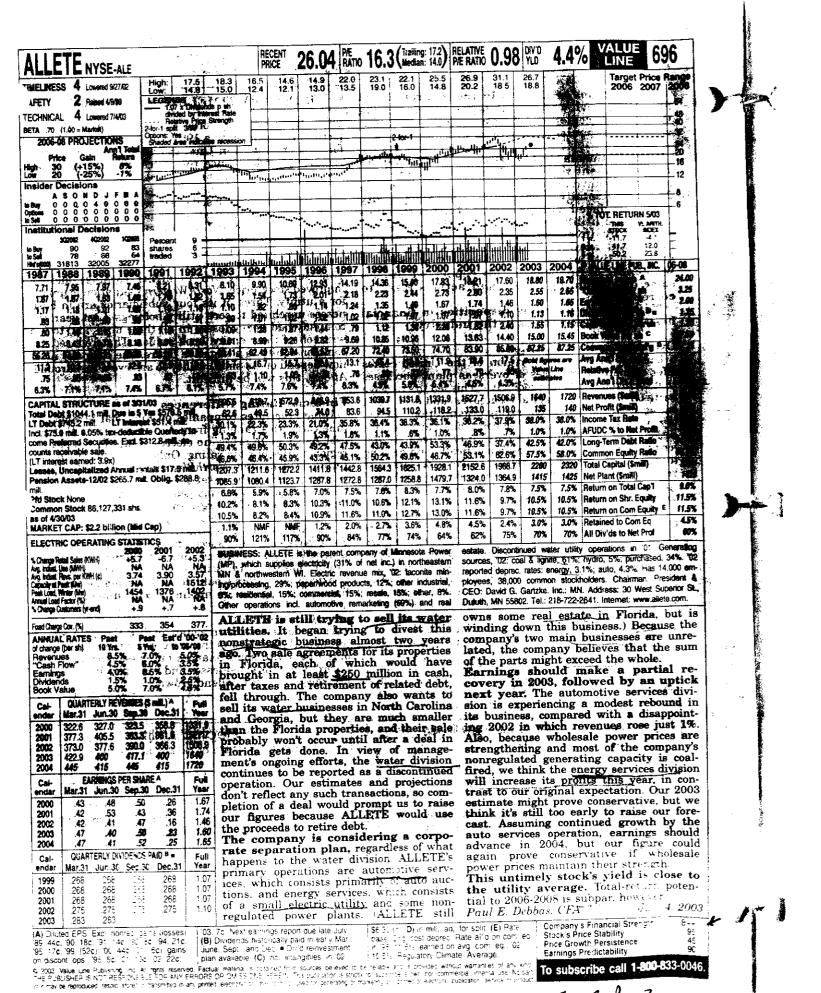
Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335

Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

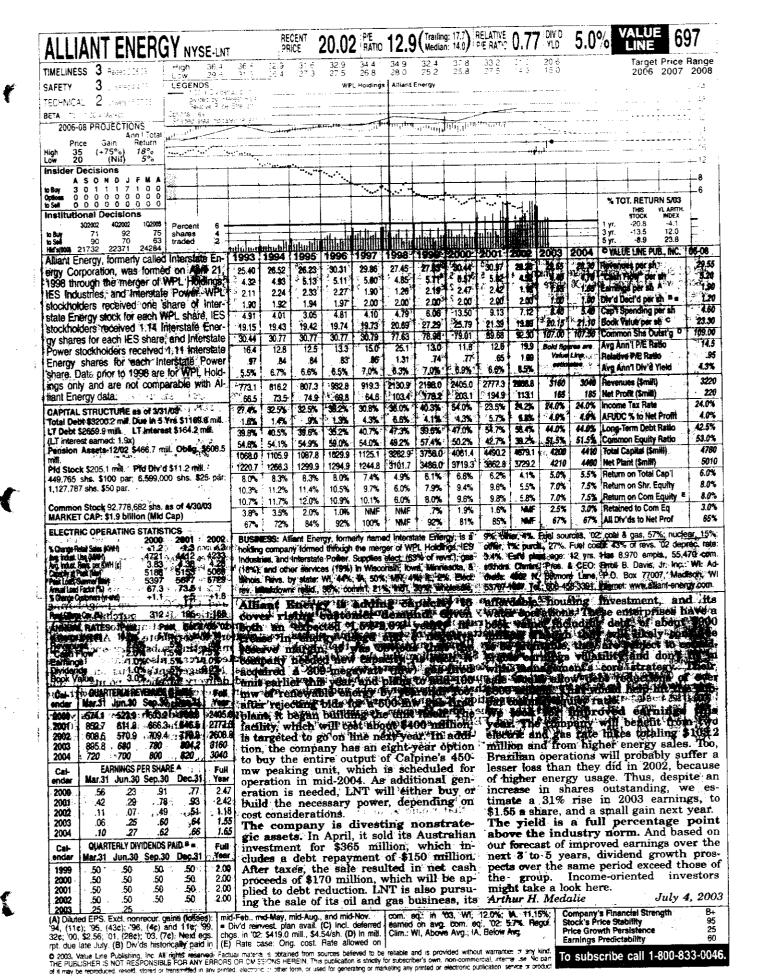
- 2. In reference to Dr. Weaver's discussion of KU's common equity ratio at pages 12-14:
- a. Explain what Dr. Weaver means when he states "provided that the same amount of equity is repurchased" at page 12, line 13.
- b. Explain what Dr. Weaver means when he states "to purchase equity from the company's owners" at page 14, line 8.
 - c. Explain the calculation on page 12, line 13 and indicate the source of the data.

Answer:

- a. The reference used the capitalization from the Barrington-Wellesley Group, Inc. Report, page V-19, May 22, 2003 filing for the year 2002 to calculate that if equity were \$106.7 million lower and leveraged items were \$106.7 million higher, the referenced capital structure would contain 50% equity. The way to accomplish that would be to issue debt and use the proceeds to repurchase equity.
- b. The company's owners possess the equity so in reference to item a, the equity would have to be purchased from its owners.
- c. See the response to a above and the calculation provided in parentheses on line 13, page 12.



Item 3, Page Z



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enough to justify an A rating for Financial return potentia is unspectacular. Strength. Finally. Black Hills is facing Paul E. Debbas (FA Augus

Company's Financial Strength Stock & Price Stability Price Growth Persistence Earnings Predictability

B+ 70 60 50

August 15, 2003

...........

% TOT. RETURN 5/03

10.0

65.0 53.4

2004 O VALUE LINE PUB., INC.

34,35 Revenues per sh

5.35 "Cash Flow" per sh

2.75 Earnings per sh A

TIMELINESS 3 2 LEGENDS SAFETY

11.6%

Target Price Range 2006 2007 2008

- 10

-7.5

06-08

34.80

6.00

3.05

2.00

2.95

25.40

15.0

1.00

4.4%

6540

3.0%

9020

9200

8.0%

12.0%

4.0%

595

557A 2006-08 PROJECTIONS
son | Yotal
Price Gain Return

(+35°°) 12°° (+5°°) 7°° Insider Decisions A S O N D J F M A

Institutional Decisions 3C22002 4C2002

Percent 164 163 108 HId's(000) 100544 104845 112384

Cinergy was formed on October 24, 1994 through the merger of Cincinnati Gas & Electric and PSI Resources, Each common share of Cincinnati Gas, & Electric was exchanged for 1.00 share of Cinergy, while each common share of PSI Resources was exchanged for 1.023 Cinergy shares. Premerger data are figures for Cincinnati Gas & Electric only and are not comparable to Cinergy data.

CAPITAL STRUCTURE as of 3/31/03 Total Debt \$4623.5 mill. Due in 5 Yrs \$2374.5

LT Debt \$3977.0 mill. 'LT Interest \$209.0 mill. (LT interest earned: 3.8x) Pension Assets-12/02 \$756.5 mill. Obiig.-\$1314.9

Pfd Stock \$371.5 mill. Pfd Div'd \$24.7 mill. 552,451 shs. 3.5% to 6.875% (\$100 par); callable at \$100 to \$108 a sh.: 303,544 shs. 4.16% to 4.32° \$25 par. call. at \$25; \$308.2 mill. preferred trust securities.

Common Stock 175,376,919 shs. MARKET CAP: \$6.6 billion (Large Cap)

% Change Customers (yr-and)

ELECTRIC OPERATING STATISTICS % Change Retail Sales (KWH; Avg. Indust. Use (MWH) Avg. Indust. Revs. per KWH (c) Capacity at Peak (Mw) Peak Load. Summer (Mw) +.8 2701 2751 4.10 11083 4.01 11249 11133 3.79 10141 11091 NA Armual Load Factor (%) +2.0 +1.3 112.8

326 (0.282 Fixed Charge Cov. (%) 365 -Past Est d 90-02 ANNUAL RATES 10% 25.0% 25 of change (per sh) Revenues "Cash Flow" Estmings Dividends Book Value

Cal-					
ender	Mar.31	PRIK30	Sep.20	Dec.31	13 Year
2000	1583	1770	2900		8422
2001	3707	3642	3324	2250	12923
2002	2192	2471	3880 :	3417	1960
2003	1282	1320	1800	1658	6060
2004	1310	1350	1830	1690	6180
Cal-	EA	RNINGS P	ER SHARI	Α	Full
endar	Mar.31	Jun.30		Dec.31	Year
2000	.87	.47	58	.58	2.50
2001	.75	.51	.80	.69	2.75
2002	58	.27	. 78	59 .	2.22
2003	.80	.45	.80	.60	2.65
2004	.72	.50	.85	.68	2.75
Cal-	QUAR	TERLY DIV	NOENDS P	AID B	Full
endar	Mar.31	Jun.30	Sep.30	Dec.31	Year
1999	45	.45	45	.45	1.80
2000	45	.45	.45	.45	-1.80
2001	45	.45	.45	.45	1.80
2002	.45	.45	.45	.45	- 1.80
2003	46	46] .

Lagra Transa

1993 1994 1995 1996 1997 1998 1997 1998 1999 2000 2001 2002 2003 70 91 34.20 37.36 37.04 27.59 19.89 18.54 19.23 20.57 510 5.15 4.59 313 3.98 4.87 3.99 4.75 4 02 434 3.87 2.22 2.65 1.97 2.10 2.50 2.75 2.22 2.19 2.30 1.30 j 2.16 1.80

1.88 Div'd Deci'd per sh Bu 1.84 1.80 1.80 1.80 1.00 1.80 1 74 1.68 ٠ س + 72 3.60 Cap'l Spending per sh 1.25 5.00 2.32 2.43 3.27 5.31 3.29 206 2.05 2.08 2.26 22.05. Book Value per sh C 19.53 21.00 17.36 18.45 16.39 16.10 16 02 16 70 17.25 15 56 16.17 179.80 Common She Outst'g 187.90 168.06 177.10 158.97 159.40 157.74 158.66 158.92 88.06 L 155.20 157.67 157.68 Avg Ann'i P/E Ratio 15 D F. Bold Bauras are 11.0 11.7 14.9 17.6 14.2 11.9 14.1 12.5 Relative P/E Ratio .60 E. .81 .72 .80 88 .86 .92 74 estin Avg Ann'i Div'd Yield 6.6% 5.6% 5.4% 6.1% 7.10, 5.6% 5.3% 5.2% 6.5% 6.2% 6180 Revenues (Smill) 8422.0 12923 11980 6060 5937 9 3242.7 4352.8 5876.3 1751.7 2924.2 3031.4 515 Net Profit (\$mill) 485 446.8 364.0 378.0 1 369:0 472 0 318.1 340.8 404.1 214.0 22 35.03 30.2% 36.0% 35.0% Income Tax Rate 36.4% 38.0% 38.4% 26.9% 36.7% 37.2% 34.5% 4026 4.0% AFUDC % to Net Profit 5.9 5.0% 5% 1.2% 2.0% 7.3% 3.1% 8.2% 2.7% 2.0% 12% 48.0% Long-Term Debt Ratio 43.0% 52.1% 50.0% 50.2% 49.7% 48.1% 46.3% 44.2% 49.7% 52.1% 47.7% 53.0% Common Equity Ratio 47.5% 42.6% 4250 45.5% 48.5% 46.3% 48.2% 41.3% | 45.2% | 46.6% 48.6% | 52.2% 8315 Total Capital (\$mill) 8173 6907.4 7745.3 3678.3 56C 5 5467.5 5313.7 5238.3 5735.6 5728.2 4868.1 9140 Net Plant (\$mili) 8648 8960 6344.5 6417.5 6630.4 6289.6 6297.1 3785.6 - 6135.3 - 6251.1 7.5% Return on Total Cap' 7.9% 7.5% 8.4% 6.14 8.7% 11.6% 7.9% : £. . 8.9% 7.7% 7.7% 11.5% 12.0% Return on Shr. Equity 13.5% 3.30 12.0% 12.1% 12.4% 14.2% Tes 12.9% 13.3% 17.4%

14.5%

4.1%

72%

12.3% + 12.6%

1.9%

86%

1.1%

BUSINESS: Cinergy Corp. is a holding company formed through the merger of Cincinnati Gas & Electric and PSI Resources. Supplies elect. (85% of revs.) to 1,500,000 customers, natural gas (15%) to 450,000 customers, in Ohio, Kentucky, and Indiana. Elect. (Gas) revs. resid. 43% (66%); commer., 28% (28%); inclust., 25% (4%); other 4% (4%). The primary metal and chemical industries

63%

12.4% : 73° , 13.6% 13.4% , 18.1%

NMF 3.1% 2.8% 6.9%

79% 81%

Cinergy's capital budget sourced in 2001, and will remain high through 1000, largely because of the need to company with the L.S. Environmental protections of the need to company with the L.S. Environmental protections at the company's coal-fired plants. EPA had filed suit against CIN for noncompliance with The Clean Air Act and seeks \$27,500 per day for each yieldation, since March, 2000. To meet, EPA requires with coal-burning upit to a gas burner and ville coal-burning unit to a gas burner and is making similar changes at nine small coal plants. The bulk of the \$800 million outlays to lower pollution and upgrade nitrogen oxide reduction technology is near completion and should be finalized next year. Construction spending will then decline, and CIN should be able to induce the EPA to drop its lawsuit.

The company has lowered its rate request in Indiana by \$25 million, to \$200 million. The revised amount reflects an updated evaluation of the utility's needs. The application seeks recovery of the \$376 million purchase of two natural gas-fired units from CIN's unregulated affiliate, the repowering of the Noblesville

are the largest customers. Fuel costs: 38% of revenues. '02 deprec. rate: 3.0%. Est'd plant age: 12 years. Fuels: coal, 87%; natural gas. 8%; other, 5%. Has 7,823, employees, 55,637 common stock-holders. Chairman. President & CEO: James E. Rogers. Inc.: Delaware. Address. 139 East 4th St., Cincinnati, OH 45202. Tel.: 513-381-2000, Internet: www.cinergy.cipts.

12.5% Return on Com Equity D

4.0% iRetained to Com Eq

70% All Div'ds to Net Prof

12.5%

4.0%

71%

10.3%

1,3%

15.0%

5.3%

unit, and improvements to the transmisand improvements to the transmission system. In addition, some \$68 million is being sought for environmental expenditures. Under Indiana law, a portion of this amount will be phased in prior to 2002 for preapproved projects. A regulatory of der on the petition is due in February. on the petition is due in February.

Earniage are on an upward path. Positives include a reduced headcount resulting from littly rear a retirement program, a likely 13-23 rise in retail energy seles. and a full year of the May, 2002 gas rate increase in Ohio. But these gains will be pared somewhat by the dilutive effect of more common shares outstanding and higher pension and medical costs. On balance, we look for 2003 earnings of \$2.65 a share. A likely rate hike in Indiana suggests improved results next year.

Income oriented investors might consider these shares. The yield is a full percentage point above the industry norm. Too, a reduction in environmental spending and our projection of steady earnings growth to 2006-2008 should allow in-creased dividends at a rate a cut above that of the group.

Arthur H. Medalie July 4, 2003

(A) EPS diluted. Excl. extraord. gains (losses): 93, (\$2.55); 96, (12c); 97, (69c); '98, (32c); '99, 43c, '03 15c, Next egs, rpt. due late July. (8) Drvids historically paid mid-Feb., mid-May. (e) 2003. Value une Publishing, Inc. All inghts reserved. Factual maters in made of the publishing to be enable and is provided without warranties or any end.

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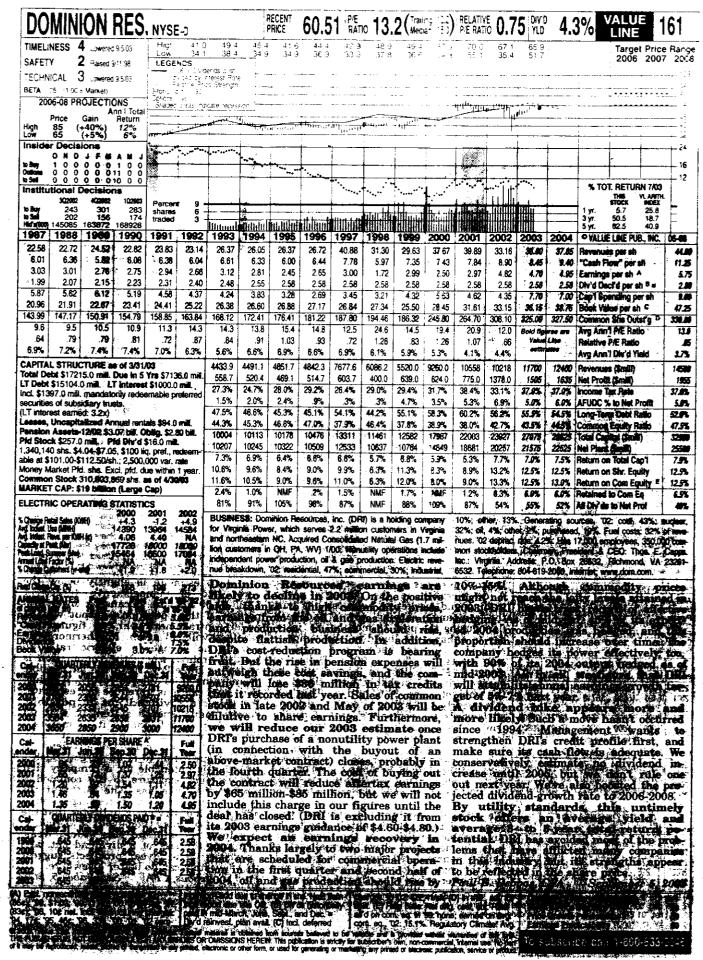
mid-Aug. and mid-Nov. • Dav'd reinvest. plan avail. (C) Incl. set chgs. In '02, \$6.41/sh.

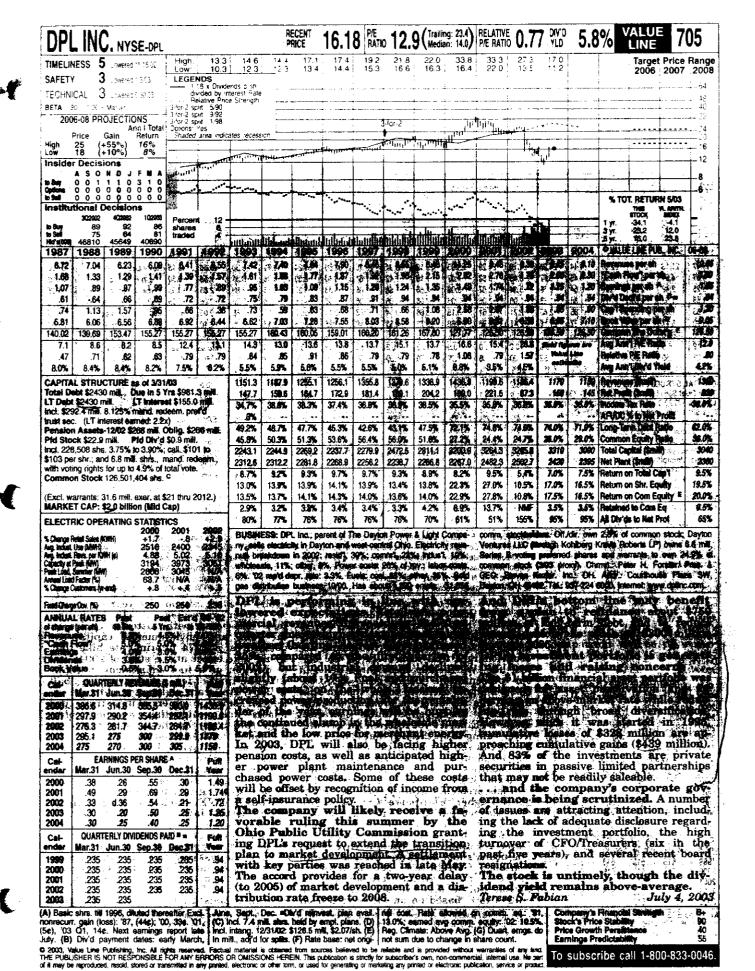
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Company's Financial Strength Stock's Price Stability Price Growth Persistence . A 95 Earnings Predictability

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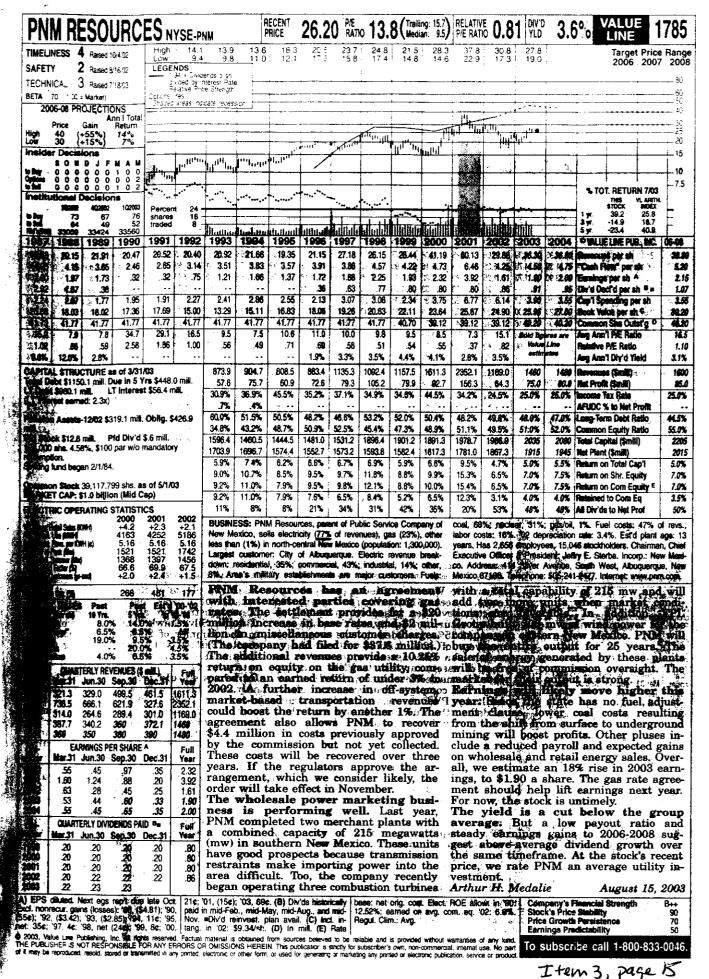
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a project (about \$1 billion) on its balance sheet this year. The depreciation will reduce earnings by approximately \$0.03 a share in 2003 and by \$0.08-\$0.09 a share in 2004. Our lower earnings estimates still fall within management's targets of \$3.45-\$3.75 this year and 5%-8% growth subsequently. We assume no change in the status of PPL's synthetic fuels investment,

QUARTERLY REVENUES (\$ mil.)

Mar.31 Jun.30 Sep.30 Dec.31

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1438

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Jun.30 Sep.30 Dec.31

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EARNINGS PER SHARE A

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QUARTERLY DIVIDENDS PAID B .

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5725.0 5429.0 6150

6700

Full Year

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3.57

3.07

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1505 1312 1314

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which generates tax credits amounting to \$0.15 a share annually. The IRS is reviewing a number of synfuels projects to see if they produce the significant chemical change that is required to qualify for the tax credits.

The modest earnings reductions notwithstanding, there is more stability in PPL's earnings than there is for most companies involved in the wholesale power markets. Much of the company's wholesale power supply business is under two long-term contracts that

uncertainty lies with its international distribution utilities (which are performing well, however) and the small proportion of its power-supply business that is not hedged. All told, only about 5% of the company's expected earnings is at risk in 2003, and 10%-15% is at risk in 2004. ť.

PPL plans to file a rate case next year. Its Pennsylvania distribution utility is earning just a mid-single-digit return on equity. Given the subpar return and the fact that the quality of PPL's service has been high, the company appears to be in a good position to justify a rate hike once its price cap expires at the start of 2005. This stock's yield is about average for

a utility, but 3- to 5-year total-return potential is well above average for the industry. The law payout ratio and improving cash faw suggest healthy annual dividend increases through 2006-2008. Paul E. Debba: CFA September 5, 2003

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Company's Financial Strength Stock's Price Stability Price Growth Persistence Earnings Predictability

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ET CAP: \$9.7 billion (Large C	ep)	3.6%	1.9%	41%	4.5%	3.9%	4.0%	11.1% 2.5%	6.7% NAF	11.5%	12.1%	12.0%			Com Equit	
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tax credits, which were designed to reduce U.S. dependence on imported oil by promoting alternative energy sources. The company expects to sell 12 million tons of this fuel in 2003. That would add \$0.75-\$0.80 a share to corporate net. But the IRS recently announced that it would withdraw the credits if the process used to convert coal into synfuel fails to meet requirements. Management is confident that its conversion procedures comply with IRS standards, but it awaits an IRS field auditor's findings. The loss of tax credits would have a serious adverse impact on PGN's prospects.

The company is reducing investments in unproductive assets. It recently sold the North Carolina Natural Gas subsidiary for \$400 million. This enterprise never lived up to expectations, and PGN took a charge of \$20 million against the asset in

this operation may be sold next year. Cash proceeds from these sales would be applied to debt reduction.

Earnings may decline this year. Positives include a full year of the April, 2002 acquisition of Westchester Natural Gas as well as higher wholesale sales, resulting from the output of new plants. But lower rates in Florida, additional shares outstanding, and higher pension costs will more than offset these pluses. Overall, we estimate a 4% reduction in 2003 earnings, to \$3.70 a share. An expected 2% gain in retail sales points to an earnings uptick next year. The stock is ranked 4 (below Average) for Timeliness.

Our earnings and dividend projections assume retention of synthetic fuel tax credits. But because of the uncertainty and the large amounts involved, investors might do well to stay on the sidelines until this matter is clarified. 2002. Also up for sale is the affordable A-thur H. Medalie September 5, 2003

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Mar.31

Mar.31 Jun.30 Sep.30 Dec.31

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Jun.30 Sep.30 Dec.31

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EARNINGS PER SHARE A

Mar.31 Jun.30 Sep.30 Dec.31

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SCANA continues to sell its telecommunications investments. Last year, the company raised \$437 million through the divestiture of its largest holding, and used the cash for debt reduction. This used the cash for debt reduction. year, SCANA sold a much smaller holding in the second quarter, raising \$40 million in cash and booking a nonrecurring gain of \$32 million (\$0.29 a share) after also taking a small impairment charge against one of its remaining telecommunications investments. Those are on SCANA's books for \$149 million. The company intends to sell them "in a prudent and timely manner.

Earnings should improve this year and next. South Carolina Electric & Gas is benefiting from a \$70.7 million (5.8%) electric rate hike that took effect at the start of February. In addition, SCANA has lowered its borrowing costs through the refinancing of debt. We believe management's 2003 target of \$2.50-\$2.60 a share is reasonable, and our forecast is at the midpoint of this range. For 2004, our figure reflects a full year of the rate increase and a decline in interest expense. Investors should note, though, that ejectric and gas sales are barely up this year due to the sluggish economy, and if there isn't much improvement in 2004, our estimate could

prove a bit high.
SCANA's construction program going well. SCE&G is building a \$450 million, 875-megawatt gas-fired plant that should achieve commercial operation next May. The electric rate hike placed \$276 million of the cost in the rate base; the utility will evaluate the need for additional rate relief once the plant comes on line. The company is also spending \$32 million on a gas pipeline that will supply fuel to the aforementioned plant. Finally, it is spending \$275 million to reinforce a dam, a project that was required by the federal government. It should be completed by the fail of 2005. These projects are necessitating some financing, including a planned \$150 million debt issuance in the fourth

quarter. SCANA stock offers an average yield, by utility standards. Assuming continued dividend growth through 2006-2008, this equity should provide investirs with a respectable total return over that time. Paul E. Debbas, CFA September 5, 2003

notinecurring gains, easies. 90 57c; tonically paid in early Jar. April July, and Oct. 1586. Pring cost. Rate arowed on comileg 53 00 02 (\$3.72 net; 65 act net. Next earning report due tate October .8; Dividends his
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\$7.16 sh (\$0\$) in milk, ad. for spir. (\$1.84 here)

223

4.5%

CHARTERLY REVENUES (\$ mil.)

Mar.31 Jun.30 Sep.30 Dec.31

23

56

61

74

77

Sep.30

385

EARNINGS PER SHARE A

662.0

740.0

649.0

726.0

775

Mar.31 Jun.38 Sep.30

27

.29

.36

.38

.40

385

288

3€

325

345

QUARTERLY DIVIBERDS PAID .

17.5%

4.5% 2.5%

816.0 1134.0

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.54

Dec.31

275

288

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210

224

Est'd '00-'02

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Full

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of change (per sh)

Revenues

Earnings Dividends

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ANNUAL RATES

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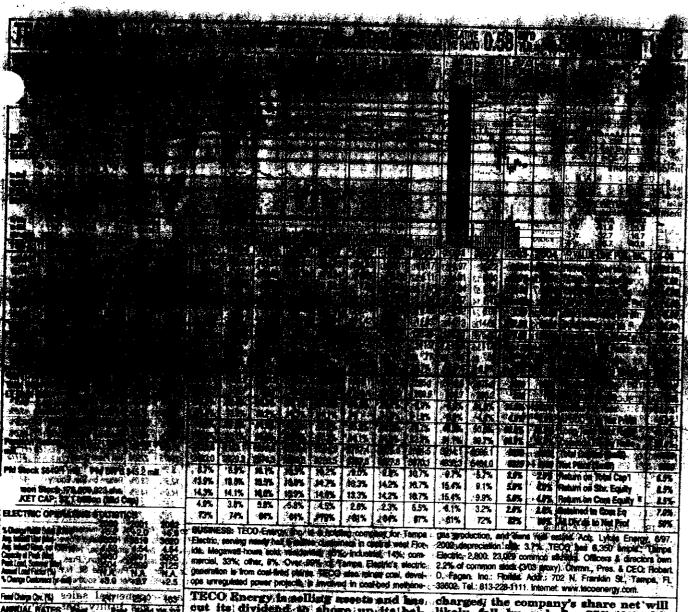
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Company's Financial Strength Stock s Price Stability Price Growth Persistence 35 Earnings Predictability

SOUTHERN CO	NYSE-so	RECENT 2	8.50 PE	15.7(Trail	ing: 14.5) RELATIVE	0.90 m	4.9% VALUE	175
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TECO Energy in selling assets and has out its dividend up shore up its belsuce sheet. The attility recently announce. ed plans to sell its Hartise Power Station for \$115 million and the assumption of all outstanding projective lates, debt. The transaction is expected to close by the end in pretar gain of ground \$60 million (not included in our parnings presentation) on the sale. The utility sale peduced its an interesting the sale of the sa race to raise cash to fund construction projects at Tampa Electric and its nonregulated power services subsidiary. The company completed the sale of its coalbed methane properties for \$140 million earlier this year in late April Moody's Investor Service downgradeds TEOP's debt rating to junk status, which activated debt obligations on the construction of the nearly completed Gila River and Union power stations. The utility raised \$550 million from two stock offerings over the past year, increasing its current shares outstanding to roughly 177 million. Even excluding

likely, fall by a herty 35% 40% this year, TECO took \$155.9 million, or \$0.89 a share, in nonrecurring charges in the second quarter alone. Most of these charges stemmed from writeoffs of its turbine purchase cancellations and nonregulated power projects. The utility had ag-gressively built up its nonregulated power gressively built up its nonregulated power assets, but overcapacity in the power markets has limited its options to sell electricity from two power plants scheduled to go online in 2003. Although the company continues to sign new contacts, it will likely not be able to sell the total capacity of its 2,145-megawatt clia River Power Station plant in Arizons and its 2,200-megawatt Union Power Station facility in Arkansas. On the bright side, TECO recently com-pleted construction of the final two units et Gila.

Conservative investors should sit on the sidelines for now. The utility remains in a very dicey financial position. Furthermore, the high dividend yield is an indication of the uncertainties that still remain here.

Perry H. Roth

September 5, 2003

icsses): '88, (6e): '93, 10e: '97, (6e): '99, (6e): '90, (5e): '03. (\$1.12). Next earnings report due lare: Oct. (B) Dividends historically paid in mid-

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355

QUARTERLY DIVIDENDS PAID= =

Mar.31 Jun.30 Sep.30 Dec.31

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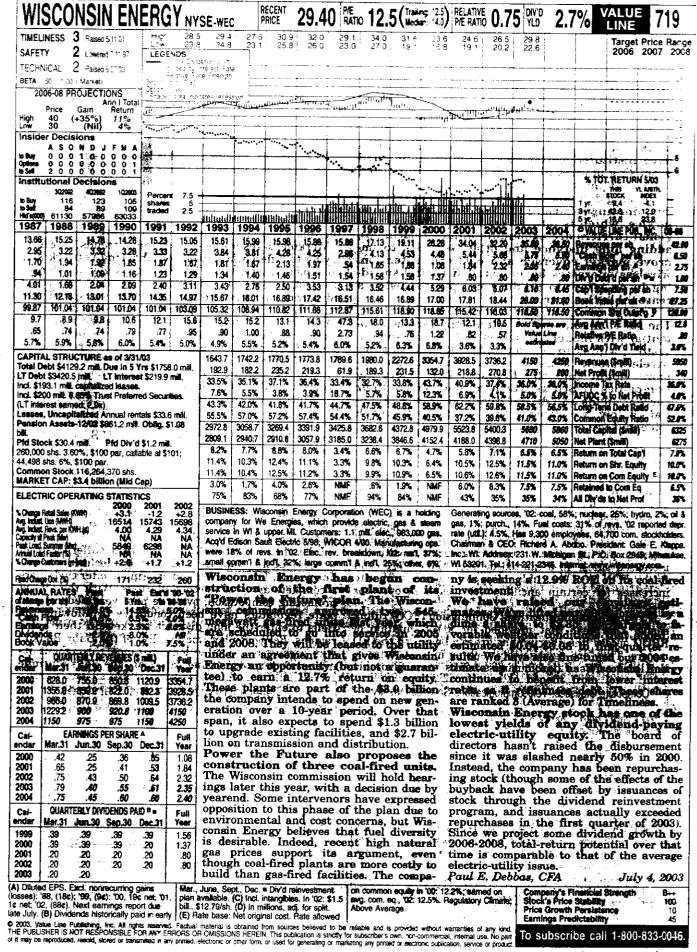
February, mid-May, mio-August, and mid-November. Div'd reinvestment plan avail. (C) Incl. deferred charges in 22 \$817.9 mill. \$4 00/sh. (D) in mili.. adjusted for split. (E) 2003, Walue Line Publishing, Inc. All rights received. Factual material is obtained from sources behaved to € PUBLISHER IS NOT RESPONSIBLE FOR ANY ERRORS OF OMISSIONS HEREW. The publication is strict.

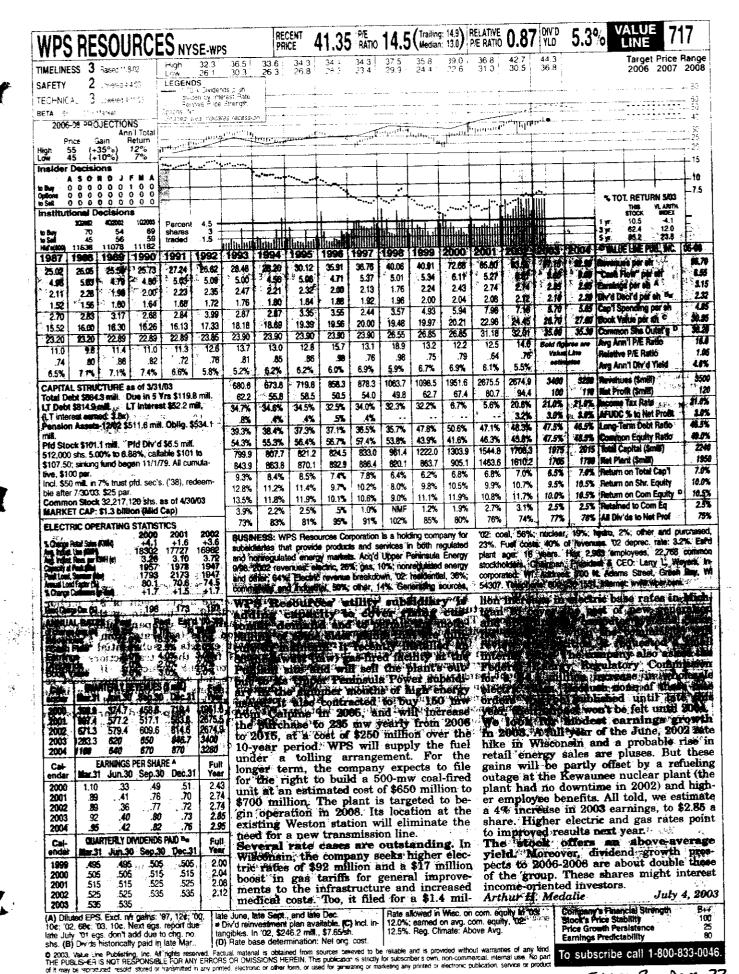
Rate base: net original cost. Allowed return on common equity in '95 12.75%. Earned on '02 avg. common equity: 12.71%. Regulatory Chmate: Above Average

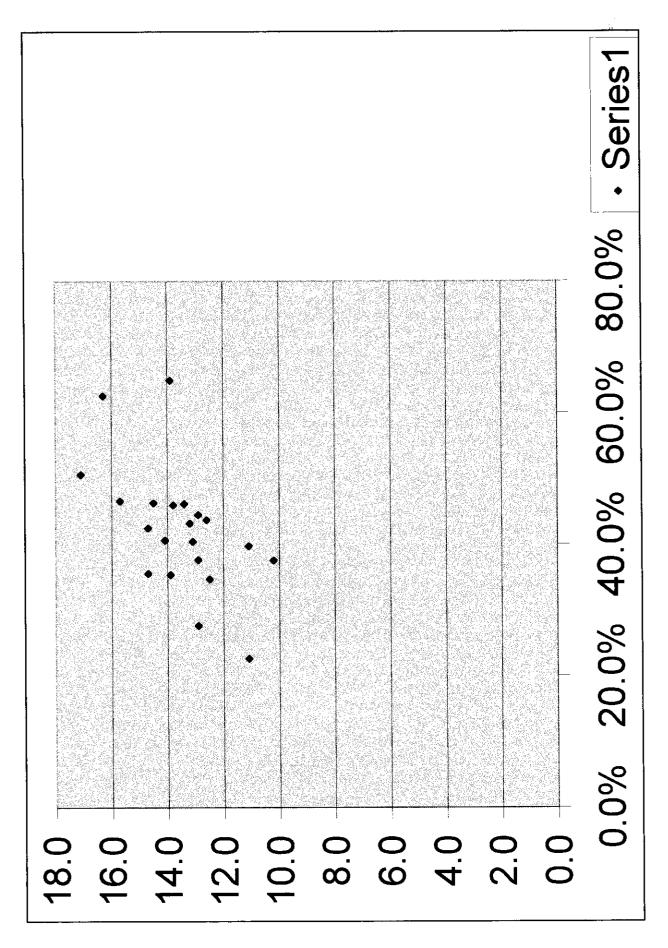
restructuring

Company's Financial Strength Stock's Price Stability Price Growth Persistence Earnings Predictability

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Responses of the Attorney General's Witness Carl G. K. Weaver to

Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335

Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

- 4. In reference to Dr. Weaver's discussion of a 50 percent target equity ratio and a 52.5 percent cap on page 8 of his testimony:
- a. Does Dr. Weaver also recommend that if the equity ratio drops below 47.5 percent, it should be resent at 50.0 percent?
- b. If the answer to (a) is negative, provide an explanation of why Dr. Weaver would not make such a recommendation.
- c. If the answer to (a) is negative, wouldn't asymmetry in his proposal increase the Companies' risk? If not, why not.

Answer:

- a. No. The control of the capital structure at or below the 50% equity level should be a management prerogative.
- b. See response to a.
- c. Financial risk would increase as the proportion of equity is lower. The company's management should be aware of this fact. However, they may possess information about the cost and benefit phenomenon that is not known by the Commission and would cause them to prudently choose an equity ratio below 47.5%. An example of such an opportunity would be access to debt that has a cost rate that is a bargain.

Responses of the Attorney General's Witness Carl G. K. Weaver to

Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335

Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

- 5. In reference to the "Percent Electric Revenues" shown on Schedule 12:
 - a. Specify what year these data reflect.
 - b. Specify what financial data are reflected in the denominator of this ratio.
- c. Provide, for each company in the two comparison groups the electric revenues and the data that make up the denominator in this ratio.
- d. Provide, for KU and LG&E, the electric revenues and the data that make up the denominator in this ratio.

Answer:

- a. Refer to the next to the last column in Schedule 12. "CD" indicates that the data source was Compact Disclosure. The CD, as indicated in the footnote to Schedule 12, was from the August 2003 disc. Constellation was incorrectly labeled. Its source was VL. It reflects 2001 data. Progress was also labeled incorrectly. Its source was CD. As indicated in the footnote to Schedule 12, the LG&E and KU data were from the FERC Form 1 and reflect 2002 data.
- b. The VL data was compiled by Value Line analysts and is assumed to be accurate. The CD data was compiled from the company's description or the segment data obtained from each company's 10-K report to the SEC.
- c. Attached are printouts of the CD data from which show the electric revenues and the denominator revenues used for the calculation. They are:

	Numerator	<u>Denominator</u>	Percent
Constellation	From Value Line		
Progress	6,600,689	8,063,505	82
Empire	In summary descripti	on	
PNM Resources	From Value Line		
DTE	12,934,000	15,955,000	81
MGE	224,987	351,626	64
Cinergy	From Value Line	•	
Southern	In business summary	description	
FPL Group	7,378,000	8,311,000	89

d. KU – 888,219,072 / 888,219,072 = 100% LG&E - 758,490,551 / 1,026,183,706 = 73.9%

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*ension Liebility None *id Stock \$190.0 mil. Pld Div'd		43.4%	47.1%	44.6%	43.9%	46,3%	48.5%	49.7%	44.7%	48.0%	40.2%	\$1.0%	20,0%	Long De	re Debt Ra	ió.	45.57
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Company Family Sales (CVP) 1999 Line Company Family Sales (CVP) 20,75 Line Company Family Sales 27,70 Line Company Sales 20,70 Line Company Sale	2000 200 +3.2 895 886 4.55 916 1VA 8490 00.5 N/	BUSINE electrical more G million. risguitate num leo Consta	y (52% of as and E The semi d busine proes: re ntive itella!	of reverse lectric, i ninrig 31 ss. Com sidential mana Lorn	es) and contral is of reversal is of	pas (17% Marylari snues ac Entegris comme comme comme comme comme comme comme comme comme comme comme comme comme	aenio lo a e declar ea 200 pai	through opvious from the second second over a by						¥ 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	es: (seid), e: orei, 5	SB 0% SB CS SB SB SB CS SB CS	
Company Family Sales (CVP) 1999 Line Company Family Sales (CVP) 20,75 Line Company Family Sales 27,70 Line Company Sales 20,70 Line Company Sale	2000 2001 +32 886 4.55 99 6550 916 1VA 648 +00.6 N/ 1.4 **	BUSINE electrical more G nation rigidal and to Attor	y 52% cas and E The man d busine proses re ntive itellat e its roade	revenue lectric, lining 31 ss. Com sidential unias Lorn garroi	nes) and on central % of reversely of revers	Marylan muse a comme comme contract con		through				in the second		¥ 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		SB 0% SB CS SB SB SB CS SB CS	
Charge Famil Sales (CVM) 1999 Late Line Barry 1996	2000 2001 +32 886 4.55 99 6550 916 1VA 648 +00.6 N/ 1.4 **	BUSINE slectrical more G malican, regulate new too Constant Consta	as and E The man d busine urces: re ative itellat e its rpade t stud berrio of Nir	iectric, ining 3 sis, Considering ining 3 sis, Considering ining 3 ini	nes) and on central or or or or or or or or or or or or or	pas (174 Marylan snues as Enlacpris convines convines (200 EN EN EN EN EN EN EN EN EN EN EN EN EN		incoln option Silvent option o		71. 0		in the second		¥ 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		SB 0% SB CS SB SB SB CS SB CS	
Cause had Site (WH) 1999 The second	2000 2001 -3.2 895 896 4.55 9.6 655 9.6 674 849 -9.5 887 288 288	BUSINE electrical more G realizable number 1 Arca Const.	as and E The sense of Live of	increase inc	n central contral aryan Planta Convenio Conveni		a de		71. 0		in the second		¥ 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		SB 0% SB CS SB SB SB CS SB CS	18.8	
Course Parts Sales (CMM) 1999 Land Course Parts (CMM) 1999 Land Course Parts (CMM) 1999 Land Course Course (CMM) 1999 Land Course Course (CMM) 1999 Land Course Course (CMM) 1999 Land Course Course (CMM) 1999 Land Course Course (CMM) 1999 Land Course Course (CMM) 1999 Land Co	2000 2001 +32 886 4.55 99 6550 916 1VA 648 +00.6 N/ 1.4 **	BUSINE electrical more G realizable number 1 Arca Const.	as and E The sense of Live of	increase inc	n central contral aryan Planta Convenio Conveni		a de		71. 0		in the second		¥ 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		SB 0% SB CS SB SB SB CS SB CS		
Charge Family Sales (CMM) 1999 Les Sales (CMM) 2008	2000 2001 32 895 886 55 96 650 886 670 888 688 288	BUSINE electrical more G more G more interest in the control of th	as and E Target and E Turned busine work we ntive a to all a to al	lectric, anima 31 st. Com addential mai didential mai dide	est and contral of some contra	Manyan Manyan muse a Enterpris comme comme to W espi M M M M M M M M M M M M M M M M M M M		opide and				and the same of th	All Control of the Co		es result	SB 0% SB CS SB SB SB CS SB CS	
Course has Siles (WH) 1999 Les Marie	2000 2001 32 895 886 55 96 650 886 670 888 688 288	BUSINE discription of the control of	as and E The send d busine wise. se ntive it ellar e its rpade partio pi Nir as the the the standard partio pi Nir as the the the the standard partio pi Nir as the the the standard partio pi Nir as the the standard partio pi Nir as the the standard partio the standa	lectric, in a second of the se	es) and on central of the central of	A CONTRACTOR OF THE CONTRACTOR									CONT.	BOX	
Comp Pant Size (CM) 1999 Lamin Say Mills (CM) 1	2000 2001 +32 866 4.55 49 655 49 655 49 606 N/ 11.5 28 288 288 288	BUSINE electrical more G malical and a loc	as and is the sound busine work to be it with the sound of him and the sound of him as a second of him as a	dectric 3 ining 3 inining 3 ining st and on central or	Manyan private a Emapyan comma co		mra months	d La	a de la companya de l	o				on control	Rox Cal		
Charge Final Sales (CMF) 1999 The Complete Comp	2000 2001 895 886 895 986 895 986 895 986 897 889 898 288	BUSINE electrical more G military and the control of the control o	as and is the send of business of the send	dectric, laborated in the second in the seco	an central or central	Mayana Mayana Mayana Comme Com Comme Comme Comme Comme Comme Comme Comme Comme Comme	on the second se	opiesand from the second secon	A Company of the comp	ri concentration debt- close	o tot to 51	cap X at	assital T	control of the contro	in the second se	Sack Sack Sack Sack Sack Sack Sack Sack	ny e
Course Parts Sizes (1994) 1999 Lamin Sizes (1994) 925 Lamin Sizes (1994) 925 Lamin Sizes (1994) 925 Lamin Sizes (1994) 955 Lamin Sizes (1	2000 2001 +32 866 4.55 916 8550 916 8050 916 107 840 107 BUSINE SHORT OF THE PROPERTY O	as and it in the second busine with the second busine with the second busine with the second busine second busine second busine second busine second busine second busine second busine second busine second busine second busine second busine second business second busines	maniformial manifo	esi and cancel an contral an contral and c	Mayyan on the convention of th	do a de de de de de de de de de de de de de	imits and with ewings	To ght as-	CEC	ou to to ti par wi etoc	Cortain Capt to the the the the the the the the the the	in east tal r. the er indu	in the second se	e cell, con a con	Secondary Second	Air air ny/e ir ch i	
Course Pentel Sales (CMP)	2000 2001 32 886 4.55 916 80.50 916 80.6 887 80.6 8	BUSINE stormer G more G	as and is the sound business of the sound of	decire in initial section in ini	an central or central	AES est su through a contract and a	rough the same and	ouse of the court	ing.	economic debt close on a CEC to 2C that	on on total to 51 par wind of total to 52 par wind of total to 52 par wind of total to 52 par wind of total to 52 par wind of total	Sertan Gertan Gap Se at th the offe off	or essital rithe en indu	por street of the street of th	er restriction of the control of the	Sack Sack Sack Sack Sack Sack Sack Sack	any in a contract of the contr
Comps Final Sales (SMF) 19.70 The last time (SM	2000 2001 -3.2 -86 -8.5	BUSINE SHOCK TO THE PROPERTY OF THE PROPERTY O	as and it in the sound busine with the street of the stree	manifest of manife	and on control of cont	May an expensive and a convenient and a convenient and a convenient and a convenient and a convenient account a convenient account a convenient account a convenient account a convenient account a convenient account a convenient account a convenient account account a convenient account	do a de de de de de de de de de de de de de	out in the sand with ewine en he en he en an offi	in a set-	con a CEC Cthat I outpe	on total to 51 par will stock to 50 period ce the	contain the contai	in assital from the end of the en	distriction of the control of the co	and the cohould 2002, average total ed ris	Garage San Andrews Commander Command	A Committee of the comm
Comps Final Sales (SMF) 19.99 Comps Final Sales (SMF) 19.28 Comps Final Sales (SMF) 19.28 Comps Final Sales 19.28 Com	2000 2001 +3.2 +86 4.55 4.9 4.55 4.9 4.55 4.9 4.55 2.9 4.55 r>4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	BUSINE SHORT OF THE PROPERTY O	as and is the state of the stat	decire in a control of the control o	an oental on central of the central	May an order a converse a convers	do mine do do mine do do mine do do mine do do do do do do do do do do do do do	oplesson opposite the sand of the sand opposite the sand opposite the sand opposite the sand of the sa	in a set-chier	ment debt. close on a CEG to 20 that I outpe and it of the	on to take to 51 par we stock to 52 par we lost	ocertanil cap % at the office we late of re-	in essital rithe er indure with cook for nost or direct	stary searcher at the rand to the week.	the colonial section in the co	Saox.	of Market
Comps Final Sales (SMF) 928 Sales Comps Final Sales (SMF) 928 Sales Comps Final Sales (SMF) 928 Sales Comps Final Sales 928 Sales Comps Final Sales 928 Sales Comps Final Sales 928 Sales Comps Final Sales 928 Sales Sales Sales 928 Sales Sales Sales 928 Sales Sales Sales 928 Sales Sales Sales 928 Sales Sales 928 Sales Sales Sales 928 Sales Sales Sales 928 Sales Sales Sales 928 Sales Sales Sales 938 Sales Sales 938 Sales Sales Sales 938 Sales Sales Sales 938 Sales Sales 938 Sales Sales 938 Sales Sales 938 Sales Sales 938 Sales Sales 938 Sales Sales 938 Sales Sales 938 Sales Sales 938 Sales	2000 2001 -3.2 -86 -3.5 -86 -4.5 -4.9 -6.5 -91 -6.5	BUSINE SHOCK TO BE	as and is the sound business of the sound of	in constant of the constant of	an central of a ce	has (17%) has been been been been been been been bee	do a de de de de de de de de de de de de de	opleant of the sand with ew Engine on the Baite of fings ear, there on the position of the sand of the	ing and a set of alti- rom set- rod	ective and to sump elections	on to to to 51 par win to 52 period ce the sine of the	certail cap % at th the offe tof, we lead of x inval	in essital r. the en industry dewith ook for nost of divide rilly of utility	Control of the contro	ser restriction of the control of th	Sack Sack Sack Sack Sack Sack Sack Sack	diverse interest and the contract of the contr
Comps from Subs (SM)	2000 2001 +32 +86 4.55 4.9 4.9 4.9 4.9 4.9 4.9 4.9 4.9 4.9 4.9	BUSINE SHORT OF THE PROPERTY O	as and in the sound business of the state of	manifest of manife	an contral of contral	May an experience of the convenience	de la de de de de de de de de de de de de de	opples of the control	The state of distriction actuals able is	source to 20 that I outpe and it sump electric pand David	otatoco de constante de constan	oertail cap icap icap icap icap icap icap icap i	in essibility of the control of the	distriction of the control of the co	er main, in one of the control of th	Stork Stork	economic de la companya de la compan
Comps final Sate (WH) 19.7 In the day of the part of	2000 2001 -322 866 -325 866 -4.55 916 -6.50 91	BUSINE SHOCK TO BE A COMMON TO BE A	as and in the send of his inches of the send of his inches of the send of his inches of the send of his inches of the send of his inches of the send of his inches of the send	man dental man dental man dental dent	an central of a ce	May an experience of the convenience	de la de de de de de de de de de de de de de	opples of the control	The state of distriction actuals able is	source to 20 that I outpe and it sump electric pand David	otatoco de constante de constan	oertail cap icap icap icap icap icap icap icap i	in essibility of the control of the	distriction of the control of the co	er main, in one of the control of th	Stork Stork	disconnection of the connection
Comps fined Sales (SMN)	2000 2001 +32 +86 +32 +86 +4.55 9.6 +6.6 +6.6 +6.6 +6.6 +6.6 +6.6 +6.6 +	BUSINE SHOCK OF THE PROPERTY O	as and is the state of the stat	decire in the control of the control	as and on contain on c	Mayyan open a converse convence converse converse converse converse converse converse convers	do not be a seried of the seri	opleand opposite the same of t	Too ight as- three trive is of a tri- rod- able is val. Rame is the space is space in the space is space in the space is space in the space is space in the space is space in the space in the space is space in the space in	timent debt-close or and to fin sump electronal panding pandin	to stock to stock to stock to stock to stock to stock to stock the single stock to s	re cap to the the cap to the cap	in essibility of the control of the	source to the control of the control	or main, and the control of the cont	Stork Stork	economic de la companya de la compan
Comps final Sate (OM) 1939 Comps final Sate (OM) 1977 In the day the jump 1925 Instruction of	2000 2001 +32 + 866 +32 + 866 +4.55 + 896 +4.55 + 896 +4.55 + 896 +6.56 + 897	BUSINE electrical more of a control more of a co	as and is the state of the stat	deciral section of the section of th	as and on control of c	May an an an an an an an an an an an an an	do a control of the c	opleand opposite the same of t	Too ght as- trive d'of- irom set- rod- able is trive from set- rod- able is trive from set- rod- able is trive from set- trive	con a con a	total total	certail cap cap to the conference of the confere	in easier the einduction of the with cook for nost of the cook for nost	distriction of the control of the co	or main, and the control of the cont	Sack Sack Sack Sack Sack Sack Sack Sack	disconnection of the connection

26

PROGRESS ENERGY INC

DESCRIPTION OF BUSINESS: THE GROUP'S PRINCIPAL ACTIVITIES ARE THE GENERATION, TRANSMISSION, DISTRIBUTION AND SALE OF ELECTRICITY AND NATURAL GAS IN PORTIONS OF NORTH AND SOUTH CAROLINA AND FLORIDA. THE GROUP IS ALSO INTO THE BUSINESS OF TELECOMMUNICATION SERVICES, COAL AND SYNTHETIC FUEL OPERATIONS, ENERGY MANAGEMENT AND MERCHANT ENERGY GENERATION. THE GROUP'S BUSINESS SEGMENTS ARE ELECTRIC UTILITIES, PROGRESS VENTURES AND RAIL SERVICES. THE ELECTRIC UTILITY ENCOMPASSES ALL REGULATED UTILITY OPERATIONS. PROGRESS VENTURES INCLUDE FUEL EXTRACTION, MANUFACTURING AND DELIVERY, SYNTHETIC FUELS PRODUCTION, MERCHANT GENERATION AND ENERGY MARKETING. RAIL SERVICES INCLUDE RAILCAR REPAIR, RAIL PARTS RECONDITIONING AND SALES AND OTHER RAIL RELATED SERVICES.IN 2002, THE GROUP ACQUIRED WALTON COUNTY POWER, LLC, WASHINGTON COUNTY POWER, LLC AND WESTCHESTER GAS COMPANY. ELECTRIC OPERATIONS ACCOUNTED FOR 82% OF 2002 REVENUES; RAIL SERVICES, 9% AND PROGRESS VENTURES, 9%.

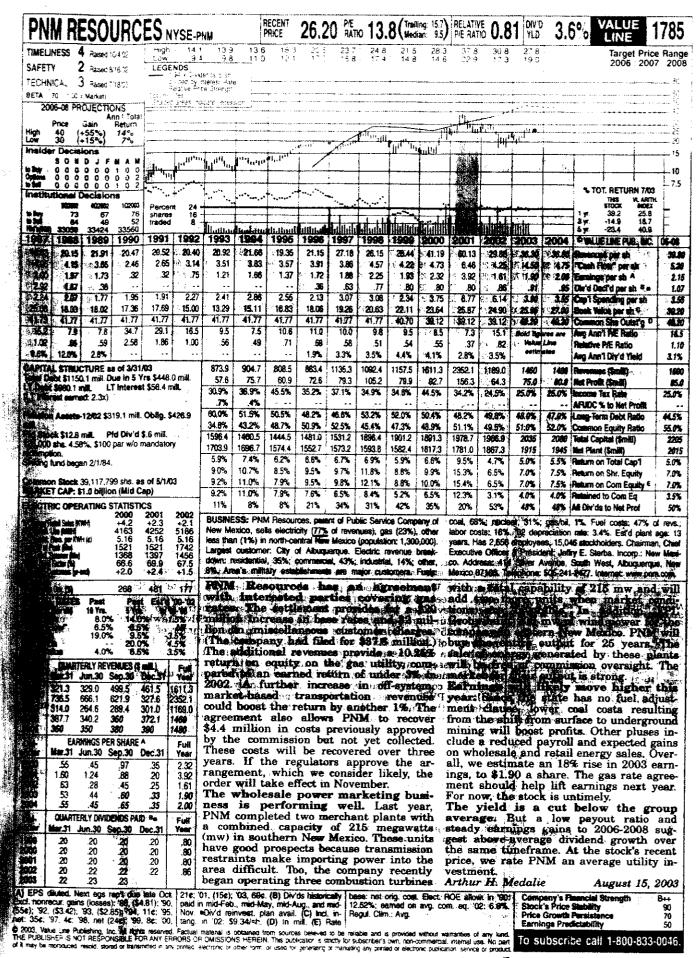
SEGMENT DATA CP&L ELECTRIC FLORIDA POWER PROGRESS VENDU RAIL SERVICES		3,538,957 3,061,732 748,317	(000S)	OP INCOME 453,115 309,594 271,088
MAIL SERVICES		714,499		, -41,733
	FIVE YEAR	8063 505	81.8	1
DATE	SALES (000\$)	NET INCOME	EPS	
2002	7,945,120	528,386	2.43	
2001	8,085,380	541,610	2.65	
2000	3,768,922	478,361	3.04	
1999	3,264,957	379,288	2.56	
1998	3,211,552	396,271	2.75	
GROWTH RATE	25.4	7.4	-3.0	
	PRELIMINAR	Y EARNINGS DATA		
ITEMS		VALUES	PERIOD	NEWS DATE
Basic EPS		1.54	6 M	07/25/2003
Fully Diluted		1.53	6 M	07/25/2003
Common Shares	Outstanding	239,816,121	10	05/15/2003
Net Sales		2,012,684,000	2Q	07/25/2003
Operating Prof		358,940,000	10	05/15/2003
Pre-Tax Income	2	111,136,000	2Q	07/25/2003
Net Income		152,823,000	2Q	07/25/2003
Total Current	Assets	2,827,752,000	10	05/15/2003
Total Assets	** 1 1 7 7 7 7	23,172,892,000	1Q	05/15/2003
Total Current		3,030,670,000	1 Q	05/15/2003
Stockholder's		6,232,890,000	3Q	11/20/2002
Book Value per Pre-Tax Extra		29.36	2Q	07/25/2003
		-224,800,000	9M	11/20/2002
Gain(Loss) due WtdAvg ComStoc		2,513,000	2Q	07/25/2003
	k(Fully Diluted)	233,438,000	1Q	05/15/2003
wearvy complete	v(rurth princed)	234,369,000	1Q	05/15/2003



EMPIRE DISTRICT ELECTRIC CO

DESCRIPTION OF BUSINESS: THE GROUP'S PRINCIPAL ACTIVITIES ARE TO GENERATE, PURCHASE, TRANSMIT, DISTRIBUTE AND SELL ELECTRICITY IN PARTS OF MISSOURI, KANSAS, OKLAHOMA AND ARKANSAS. THE GROUP ALSO PROVIDES WATER SERVICE TO THREE TOWNS IN MISSOURI. THE GROUP PROVIDES ELECTRIC SERVICE AT RETAIL TO 119 INCORPORATED COMMUNITIES AND TO VARIOUS UNINCORPORATED AREAS AND AT WHOLESALE TO FOUR MUNICIPALLY-OWNED DISTRIBUTION SYSTEMS AND TWO RURAL ELECTRIC COOPERATIVES. THE GROUP OPERATES UNDER FRANCHISES HAVING ORIGINAL TERMS OF TWENTY YEARS OR LONGER IN VIRTUALLY ALL OF THE INCORPORATED COMMUNITIES. THE GROUP ALSO OFFERS ELECTRONIC MONITORED SECURITY SERVICES, GENERATORS, SURGE SUPPRESSORS, DECORATIVE LIGHTING AND OTHER ENERGY SERVICES. ON 01-FEB-2003, THE GROUP ACQUIRED JOPLIN.COM HOLDINGS, INC. ELECTRICITY SALES ACCOUNTED FOR 96% OF 2002 REVENUES; NON-REGULATED INCOME, 3% AND WATER SUPPLY, 1%.

	FTVF	YEAR SU	MMAF	RY				
DATE				INCOME		EPS		
2002	305,903	(000,7)		25.524		1.19		
2002	265,821			10,403		0.59		
2000	261,691			23,617		1.35		
1999	243,243			22,170		1.13		
1998	239,858			28,323		1.53		
GROWTH RATE	6.2			-2.5		-6.0		
	PRE1	LIMINARY	EAR	NINGS D	ATA			
ITEMS				•	VALUES	PERIO)	NEWS DATE
Basic EPS					0.27	10	}	04/30/2003
Primary EPS					0.28	40)	01/22/1998
Primary EPS					1.29	121	4	01/22/1998
Fully Diluted	EPS				0.27	10)	04/30/2003
Common Shares				22,6	84,051	19	5	05/27/2003
Net Sales				76,9	06,000	10	5	04/30/2003
Operating Prof	it			14,1	85,000	19	2	05/27/2003
Pre-Tax Income	9			9,4	03,000	10	2	05/27/2003
Net Income				12,7	86,000	91	√ i	05/26/2003
Total Current	Assets			75,7	58,365		2	05/27/2003
Total Assets				982,0	21,501	19	_	05/27/2003
Total Current	Liabilities				56,244		2	05/27/2003
Stockholder's	Equity			331,6	86,614	19		05/27/2003
WtdAvg ComSto				22.6	07,643	19	2	05/27/2003
WtdAvg ComSto				16,7	29,279		2	01/22/1998
WtdAvg ComSto				•	99,269		M	01/22/1998
WtdAvg ComSto	ck(Fully Dil	uted)		22,6	07,643	10	ð	05/27/2003



SEGMENT DATA (SO ELECTRIC UTILITY GAS UTILITY	URCE: 10-	K 12/31/2002)	12,934,000~ 3,021,000	(000s)	OP INCOME NA NA
		A COMPANY OF THE PARK TO THE P	15,955,000	•	
		YEAR SUMMARY	TCOME	EPS	
DATE	SALES (NA	
***	749,000		2,000	NА	
	791,000		2,000 8,000	NA	
	638,000		3,000	NA	
	499,000		3,000 3,000	NA	
1999 4,	174,000	44.	9.2	NA	
GROWTH RATE	12.7		J • Z		
		ALANCE SHEET	c i		
		ASSETS (000	12/31/2	001	12/31/2000
FISCAL YEAR ENDIN	G	12/31/2002	425,		152,000
CASH		370,000	987,		562,000
RECEIVABLES		1,198,000	505,		335,000
INVENTORIES		576,000	562,		603,000
OTHER CURRENT ASS		620,000 2,76 4, 000	2,479,		1,652,000
TOTAL CURRENT ASS		17,862,000	17,073,		13,162,000
PROP, PLANT & EQU	1 P	8,049,000	7,524,		5,775,000
ACCUMULATED DEP		9,813,000	9,549,		7,387,000
NET PROP & EQUIP	· · · · ·	904,000	1,042,		667,000
INVEST & ADV TO S	UBS	2,982,000	3,316,		2,688,000
DEFERRED CHARGES		2,119,000	2,003,		24,000
INTANGIBLES	e ram	656,000	492,		238,000
DEPOSITS & OTH AS	-SE1	19,238,000	18,881,		12,656,000
TOTAL ASSETS		10,200,	•		
I	MNUAL LIA	BILITIES (000	0\$)		10/21/2000
FISCAL YEAR ENDIN	1G	12/31/2002	12/31/2		12/31/2000
NOTES PAYABLE		414,000	•	.000	503,000 404,000
ACCOUNTS PAYABLE		647,000	581,	. 000	297,000
CUR LONG TERM DE		NA	F 2 T	NA	NA
CUR PORT CAP LEAS	SES	1,018,000		,000	162,000
ACCRUED EXPENSES		164,000	225,	,000 NA	116,000
INCOME TAXES		AN	000	,000	565,000
OTHER CURRENT LI		970,000	2,827		2,047,000
TOTAL CURRENT LI	AΒ	3,213,000	5,892		NA
MORTGAGES		5,656,000	1,853		1,971,000
DEFERRED CHARGES	/ INC	1,263,000	1,947		3,894,000
LONG TERM DEBT		2,047,000 82,000		,000	145,000
NON-CUR CAP LEAS			1,684	•	590,000
OTHER LONG TERM		2,412,000 14,673,000	14,292		8,647,000
TOTAL LIABILITIE		3,052,000	2,811		1,912,000
COMMON STOCK NET		2,132,000	1,846		2,097,000
RETAINED EARNING	٥	-619,000		,000	Аи
OTHER EQUITIES	m' V	4,565,000	4,589		4,009,000
SHAREHOLDER EQUI		19,238,000	18,881		12,656,000
TOT LIAB & NET W	OVIII	20,100,000	•		

SEGMENT DATA (SOURCE: ELECTRIC OPERATIONS GAS OPERATIONS	10-к 12/31/200	32) SALES 224,987 126,639	(0005)	OP INCOME 31,045 9,527
		351626		
	VE YEAR SUMMAI		EDG	
		INCOME	EPS	
2002 347,09		29,193	1.69	
2001 333,71		27,245	1.62	
2000 324,10	8	27,355	1.67	
1999 274,03		23,746	1.48	
1998 249,75	2	22,230	1.38	
GROWTH RATE 8.	5	7.0	5.1	
	BALANCE SHEE	т		
MA	WAL ASSETS (0	00\$)		
FISCAL YEAR ENDING	12/31/2002	12/31/20	01	12/31/2000
CASH	2,998	2,4	21	4,307
RECEIVABLES	54,814	41,5	47	38,161
INVENTORIES	26,308	28,6	83	21,392
OTHER CURRENT ASSETS	12,851	10,5	73	36,660
TOTAL CURRENT ASSETS	96,971	83,2	24	100,520
PROP, PLANT & EQUIP	825,571		05	952,035
ACCUMULATED DEP	365,243	340,6	60	510,381
NET PROP & EQUIP	460,328	403,2	45	441,654
INVEST & ADV TO SUBS	35,493	29,8	47	3,988
DEFERRED CHARGES	36,103	27,7	58	25,442
TOTAL ASSETS	628,895			571,604
ANIMIAA	LIABILITIES (0	nnsı		
FISCAL YEAR ENDING	12/31/2002		101	12/31/2000
	34,298	"		44,000
NOTES PAYABLE	32,039			28,792
ACCOUNTS PAYABLE CUR LONG TERM DEBT	NA			200
	3,161	·		10,680
ACCRUED EXPENSES	11,049			3,565
OTHER CURRENT LIAB	80,547			87,237
TOTAL CURRENT LIAB	62,450			100,618
DEFERRED CHARGES/INC	192,149			NA
LONG TERM DEBT	60,972			NA
OTHER LONG TERM LIAB	396,118			187,855
TOTAL LIABILITIES	•			383,749
COMMON STOCK NET	227,370 5,407			NA
OTHER EQUITIES				383,749
SHAREHOLDER EQUITY	232,777			571,604
TOT LIAB & NET WORTH	628,895) 544,0	7.14	DIT, DAR

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Target Price Range 2006 2007 2008

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Cinergy was formed on October 24, 1994	1993 1994	F1995 19						70.91	34.20	34.35	Revenues pe	rsh i	34.80
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I Floring and PSI Resources, Each WHITEMIA	3.87 3 13			197	2.10	2.50	2.75	2.22	2.65	2.75	Earnings per	SD T	
share of Cincinnati Gas, & Electric was ex-	2.16 1.30	2.22	219 230	- 1		1	1.80	1.80	1.84	1.88	Div'd Deci'd	persh 🕮 📑	2.00
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changed for 1.00 share of Cinergy, while	2.26		2.05 2.08	2.32	2.43	3.27	5.31	5.06		3.00	Cap i operio		25.40
each common share of PSI Resources was			6.39 16.10	16.02	16.70	17.36	18.45	· 19.53	21.00	.22.00	Book Value	PER 8/1 "	187.90
exchanged for 1.023 Cinergy shares. Pre-	17.25 15.56		0.45	158.66	158.92	158.97	159.40	168.66	177.10	179.80	Common Sh	s Outst'g 🔭	
merger data are figures for Cincinnati Gas &	88.06 155.20	157.67 15	7 68 157.74				11.7	15.0	Bade Su	WES 2/9	Avg Ann'i Pi	E Ratio	15.0
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CAPITAL STRUCTURE as of 3/31/03	1751 7 2961	3031.4 32	42.7 4352.8	5876.3	5937.9	8422.0	12923	11960		0100	FIGURE INC.		595
Total Debt \$4623.5 mill. Due in 5 Yrs \$2374 5			69.0 472.0	318.1	340.8	404.1	446.8	354.C	485		Net Profit (\$		
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rt Tinterest earned: 3.8x)	3.1% 5.7%	2.7%	2.0% 1 1.2%	.5%	1.2%	2.0%	7.3%	1		4	Long-Term		43.0%
Pension Assets-12/02 5756.5 mill. Oblig\$1314.9			7.7% 44.2%	49.7%	52.1%	50.2%	52.1%	52.7%	50.0%				53.0%
en il	1 44.			48.5%	46.3%	48.2%	42.6%	425	45.5%		Common Ec		
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less (2) she 3.5% to 6.875% (\$100 par); Camedow	3678.3 560	5467.5 5	313.7 4868.1	5238.3	5735.6		1	1	8960		Net Plant (\$		9200
1 of \$100 to \$108 a shr 309.544 shs. 4.10 9 10	1	3 6251.1 6	289.6 6297.1	6344.5	6417.5	6630.4	8236.9				Return on T	otal Cam'l	8.0%
4,32% \$25 par. call. at \$25; \$308.2 mil. preferred			B 70 11 60	7.7%	7.7%	84%	7.9%	6.12	7.5%				
trust securities.	7.90€ €.75			, ,	12 4°s	14.2%	13.5%	<u>'</u> 3.2%.	12.0%		6 Return on S		11.5%
(ros) seconnes.	11.5%	: 29°-	33% , 174%	1	*		15.0%	*	12.5%	12.59	Return on C	Com Equity D	12.0%
Common Stock 175,376,919 sns.	12.4%	5 13.5°c	3 4°= 18 1°0	12.3°e	12.6	14.5%			4.07		Retained to		4.0%
MARKET CAP: \$6.6 billion (Large Cap)		F 3 120 i	23% 63%	1.1%	1.94	4.1%	5.3%						67%
MARKET CAP: \$6.6 SHILLON (Lange Cap)		•	81% 53%		86%	72%	1 65°c						
ELECTRIC OPERATING STATISTICS	80° - 7			1				· · · · ·		- Euni	costs: 38% of	revenues.	2 deprec
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Ava noist flevs per With \$ 3.79	paes elect	CO UNITERS	rs in Ohio, Ke	ntivity a	ad India:	sa Elect							
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Freet Charge Cov. No. 328 : 282 Past Est d-90-02 5 fts - le 00-05 25.0% - 20-05 20-06 20-06 20-06 20-06 ANNUAL RATES Page ANNUAL RATES PAR
of change (per sh) 1997 (14.0%
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2000 2001	1583 3707			2789 2250	8422
2002	2192 1282			3417 1658	6060
2003 2004	1310	1350	1830	1690	6180
Cal- endar	EA Mar.31	RNINGS P Jun.30	ER SHARE Sep.30	Dec.31	Full Year
2000	.87	.47	.58	.58	2.50
2001	.75	.51	.00	.69	2.75 2.22
2002 2003	58 80	.27 [.] . 45	.78 . 80	.59 ₁ .	2.65
2004	.72	.50	.85	.68	2.75
Cal-		TERLY DIV	ADENDS P	(A)() the	Full Year
endar	Mar.31		Sep.30		
1999	45	45	.45	.45	1.80
2000	.45	.45	45	.45	1.00

outlays to lower pollution and upgrade nitrogen oxide reduction technology is near completion and should be finalized next year. Construction spending will then decline, and CIN should be able to induce the EPA to drop its lawsuit.

The company has lowered its rate request in Indiana by \$25 million, to \$200 million. The revised amount reflects an updated evaluation of the utility's needs. The application seeks recovery of the \$376 million purchase of two natural gas-fired units from CIN's unregulated af-filiate, the repowering of the Noblesville

Cinergy's capital budget soared in unit, and improvements to the transmission and will remain high through sion system in addition, some \$68 million strength with the U.S. Environmental Repeats of the need to company is being south for environmental expendition of this livery with the U.S. Environmental Repeats of the need to company is being south for environmental expendition of this livery with the U.S. Environmental Repeats of the need to company is being south for environmental expendition. Agency's directive to reduce an investment projects. A regulatory order plants. EPA had filed suit against CIN for noncompliance with The Clean Air Act and seaks \$27,500 per day for each violation and upgrade will coal-burning unit to a gas burner and is making similar changes at nine small coal plants. The bulk of the \$800 million outlays to lower pollution and upgrade mitrogen exide reduction technology is higher pension and medical costs. On balnigner pension and medical costs. On balance, we look for 2003 earnings of \$2.65 a share. A likely rate hike in Indiana suggests improved results next year. Income-oriented investors might consider these shares. The yield is a full percentage point shows the industry norm.

percentage point above the industry norm. Too, a reduction in environmental spending and our projection of steady earnings growth to 2006-2008 should allow increased dividends at a rate a cut above

that of the group. Arthur H. Medalie

(A) EPS diluted. Excl. extraord, gains (losses): mid-Aug. and mid-Nov. • Divid rerivest, plan 196: 11.0%. Earned avg. com. eq. 02: 1.9%. Stock's Price Stability 95. 93. (\$2.55): 96. (12c): 97. (69c): '98. (32e): avail. (C) incl. set ong na cost. Allowed on (P) in mill, adjust for split.

(B) Divids instructed yeard multi-Ets. mich-May (C) mid-Aug. and mid-Nov. • Divid rerivest, plan 196: 11.0%. Earned avg. com. eq. 02: 1.9%. Stock's Price Stability 95. Stock's Price Stability 97. (D) Rate bass retrong naccost. Allowed on (F) in mill, adjust for split.

(B) Divids instructed yeard multi-Ets. mich-May (C) mid-nary in 196: 11.0%. Earned avg. com. eq. 02: 1.9%. Stock's Price Stability 95. Stock's Price Stability 95. One eq. 07: 1.9%. The company's Financial Strength Application of the compan

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SOUTHERN CO

DESCRIPTION OF BUSINESS: THE GROUP'S PRINCIPAL ACTIVITIES ARE THE ACQUISITION, DEVELOPMENT, BUILDING, OWNERSHIP, AND OPERATION OF POWER PRODUCTION AND DELIVERY FACILITIES. THE GROUP OWNS GENERATING PLANTS AND OTHER SOURCES OF POWER THAT ARE INTERCONNECTED BY TRANSMISSION FACILITIES SUPPORTED BY HEAVY-DUTY HIGH VOLTAGE LINES. THE GROUP ALSO PROVIDES ENERGY-RELATED SERVICES TO UTILITIES AND INDUSTRIAL COMPANIES. THE GROUP OPERATES THROUGH TWO SEGMENTS NAMELY: INTEGRATED SOUTHEAST UTILITIES AND OTHER. INTEGRATED SOUTHEAST UTILITIES PROVIDE ELECTRIC SERVICES IN THE STATES OF ALABAMA, GEORGIA, FLORIDA AND MISSISSIPPI. THE OTHER SEGMENT PROVIDES TELECOMMUNICATIONS, ENERGY PRODUCTS AND SERVICES AND LEASING AND FINANCING SERVICES. ELECTRIC SERVICES ACCOUNTED FOR 978 OF 2002 REVENUES AND OTHER, 3%.

PRELIMINARY EARNINGS DATA

ITEMS	VALUES	PERIOD	NEWS DATE
Basic EPS	0.41	1Q	05/05/2003
Primary EPS	0.28	4 Q	01/20/1998
Primary EPS	1.42	12M	01/20/1998
Fully Diluted EPS	0.41	1Q	05/05/2003
Common Shares Outstanding	720,957,179	10	05/21/2003
Net Sales	2,553,000,000	1Q	05/05/2003
Operating Profit	588,083,000	1Q	05/21/2003
Pre-Tax Income	419,000,000	1Q	05/05/2003
Net Income	298,000,000	10	05/05/2003
Total Current Assets	2,922,000,000	10	05/21/2003
Total Assets	32,850,000,000	1 Q	05/21/2003
Total Current Liabilities	4,822,000,000	1Q	05/21/2003
Stockholder's Equity	8,871,000,000	10	05/21/2003
Gain(Loss) from Disc Oprs	367,000	1Q	05/21/2003
WtdAvg ComStock(Basic)	718,943,000	1Q	05/21/2003
WtdAvg ComStock(Primary)	691,000,000	4Q	01/20/1998
WtdAvg ComStock(Primary)	685,000,000	12M	01/20/1998
WtdAvg ComStock(Fully Diluted)	724,891,000	1Q	05/21/2003

FPL GROUP INC

DESCRIPTION OF BUSINESS: THE GROUP'S PRINCIPAL ACTIVITY IS TO GENERATE, TRANSMIT, DISTRIBUTE AND MARKET ELECTRIC ENERGY THROUGH SUBSIDIARIES: FLORIDA POWER AND LIGHT COMPANY AND FLORIDA POWER AND LIGHT COMPANY GROUP CAPITAL. THE GROUP SUPPLIES ELECTRIC SERVICES TO APPROXIMATELY 4.0 MILLION CUSTOMERS AND TO MOST OF THE EAST AND LOWER WEST COASTS OF FLORIDA. FPL GROUP CAPITAL HOLDS THE CAPITAL STOCK AND PROVIDES FUNDING FOR THE OPERATING SUBSIDIARIES OTHER THAN FPL. OTHER FPL GROUP OPERATIONS INCLUDE SALE OF WHOLESALE FIBER-OPTIC NETWORK CAPACITY TO FPL AND OTHER NEW AND EXISTING CUSTOMERS, PRIMARILY TELEPHONE, CABLE TELEVISION, INTERNET AND OTHER TELECOMMUNICATIONS COMPANIES. THE GROUP OPERATES SOLELY IN THE DOMESTIC MARKET.

SEGMENT DATA FPL FPL ENERGY OTHER	(SOURCE: 10-K 12/3	7,378,000 829,000 104,000	(000S)	OP INCOME 717,000 53,000 -75,000
	FIVE YEAR S			
DATE	SALES (000\$)	NET INCOME	EPS	
2002	8,311,000	473,000	4.02	
2001	8,326,000	781,000	4.63	
2000	7,062,000	704,000	4.14	
1999	6,438,000	697,000	4.07	
1998	6,661,000	664,000	3.85	
GROWTH RATE	5.6	-8.1	1.0	
	PRELIMINARY	EARNINGS DATA		
ITEMS		VALUES	PERIOD	NEWS DATE
Basic EPS		3.93	9M	05/24/2003
Primary EPS		0.52	4Q	01/15/1998
Primary EPS		3.57	12M	
Fully Diluted	EPS	3.93	9м	05/24/2003
Common Shares	Outstanding	183,288,175	1Q	05/15/2003

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Responses of the Attorney General's Witness Carl G. K. Weaver to Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335 Louisville Gas and Electric Company's and Kentucky Utilities Company's

6. In reference to Dr. Weaver's assumption in a footnote on Schedule 12 that LG&E and KU would have a B++ Value Line Financial Strength Rating:

Initial Requests for Information

- a. Provide a complete explanation of the basis for this assumption.
- b. Provide any data or calculations used by Dr. Weaver in reaching this conclusion.

Answer:

a. As stated on page 23, lines 11 through 14, the Financial Strength Rating is an assessment of financial leverage, business risk, company size and other factors made by Value Line analysts for each of the companies they follow. With respect to financial leverage, three of the twenty-one companies have an "A" rating and one of the companies has an "A+" rating. These four companies have an equity to total capital percentage of between 40.6% and 50.7% and three of these companies have a percent electric revenues between 85% and 95%.

KU's equity ratio exceeds the equity ratio of the four "A" or "A+" rated companies. The two companies with equity ratios greater than KU are rated "B" or "B++". KU has a high percent of electric sales so it would be in an "A" or "A+" range for this category. There is little business risk and the electric companies would be similar with regard to this measure. KU is a relatively small company and this would place it in a "B" category. I do not know what the other factors that the analysts would consider. It is my judgment that KU would have a Financial Strength Rating of "B++."

LG&E's equity ratio is within the range of the ratios for the four companies with an "A" to "A+" range. LG&E has a lower percent electric sales than three of the four companies in the "A" to "A+" range. It too is a relatively small company. It is my judgment that it would also have a "B++" Financial Strength Rating.

Responses of the Attorney General's Witness Carl G. K. Weaver to Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335 Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

- 7. Separately for each column (i.e., Financial Strength Rating, Equity Ratio, Percent Electric Revenues and Average) on Schedule 12:
 - a. Provide an explanation of why each factor was used.
- b. Indicate whether a higher number in the column indicates higher or lower risk to the company in question and explain how Dr. Weaver reaches this conclusion.

Answer:

- The Value Line Financial Strength Rating, as stated on page 23 in the testimony in lines a. 11-14, "is an assessment of financial leverage, business risk, company size, and other factors made by Value Line analysts for each of the companies that they follow." Companies that have a similar Financial Strength Rating in the opinion of the Value Line analysts would be somewhat similar to each other with respect to these factors. Equity to total capital was used because it too is a measure of financial risks. These were used because both KU and LG&E have higher equity ratios than most of the companies in the selection pool and it is important to capture this extremely low financial risk. Percent electric revenues is an important measure to obtain a group of companies that are as similar as possible to one another. Many electric companies have diversified their operations since the advent of deregulation. Eleven of the 21 companies in the selection pool derive less than 70% of their sales revenues from electric sales. The objective of company selection is to obtain companies that are as similar as possible to KU and LG&E. As indicated at the top of page 23 in the testimony, no two companies are exact clones of one another. These criteria assure that the companies are as similar as possible to KU and LG&E so that the market data reflects the return on equity of companies that have similar risk, assure the financial integrity of KU and LG&E, and enable these companies to attract capital.
- b. The numbers in the columns were not used as absolute measures of risk. They were used to gauge similarity.

Responses of the Attorney General's Witness
Carl G. K. Weaver to
Commonwealth of Kentucky PSC Case No. 2003-00334
And Case No. 2003-00335
Louisville Gas and Electric Company's and Kentucky Utilities Company's
Initial Requests for Information

8. In reference to Dr. Weaver's statement on page 12, lines 19-20, indicate why the interest rates on utility bonds might increase by an amount greater than Treasury notes might increase.

Answer:

The returns required for a given level of risk have a non-linear relationship. Each investor has his own set of risk/return tradeoffs and for risk averse investors, as risk increases, the amount of expected return required to attract their investment increases at an increasing rate.

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Responses of the Attorney General's Witness Carl G. K. Weaver to

Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335

Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

9. In reference to Schedules 17-28, provide the interest, dividends and earnings figures used in the calculations for each company.

Answer:

Sch.	/ Yr.	Company	Interest	<u>Dividends</u>	Earnings
17	01	Cinergy	265,792	286,289	442,279
	02		249,906	298,292	360,576
18 2	3 01	DTE	468,000	325,000	332,000
	02		548,000	338,000	632,000
19	01	FPL	324,000	377,000	781,000
	02		311,000	400,000	473,000
20	01	MGE	13,789	22,341	27,245
	02		12,545	23,170	29,193
21	01	Southern	744,000	922,000	1, 262,000
	02		684,000	958,000	1,318,000
22	01	Constellation	225,600	120,700	90,900
	02		268,300	137,800	525,600
24	01	Empire	30,010	22,613	10,402
	02		30,571	27,885	25,524
25	01	PNM	64,840	31,876	150,433
	02		61,412	34,226	64,272
26	01	Progress	672,893	432,078	541,610
	02		633,441	479,981	528,386
27	01	KU	34,024	32,756	96,414
	02		25,688	2,256	93,384
28	01	LG&E	37,922	27,995	106,781
	02		29,805	73,300	88,929

Note: Schedule 17 contained an error in the Quality of Earnings Measure. Attached is a new Schedule 17 with the change in bold print. Also attached is a new Schedule 16 with the change also in bold. Please make the following changes to the testimony:

Page 31, line 10: 3.06 should be 2.46 Page 36, line 12: 3.06 should be 2.46 Page 36, line 13: 3.06 should be 2.46

Cash Flow Summary

Ć	Ā	Average Cash Flow Coverage of:	ow Coverage o	of.
Company			Invocation	Quality
Name	Interest	Dividends	Activities	or Earnings
Kentucky Utilities:				
Cinergy	4.34	2.92	0.79	2.19
DTE Energy	2.76	2.69	0.61	9 6
FPL Group Inc.	7.76	5.50	0.65	3.71
MGE Energy	6.05	2.94	1.88	238
Southern Company	4.67	2.77	0.91	2.02
Average	5.12	3.36	26.0	2.46
Kentucky Utilities	7.19	41.82	1.05	1.92
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	j 	 	 	İ
LG&E:				
Constellation Energy	4.17	6.08	1.79	4.12
DTE Energy	2.76	2.69	0.61	1.99
Empire District	2.83	2.15	0.72	3.19
PNM Resources	4.32	6.56	0.64	1.84
Progress Energy	3.32	3.31	0.79	2.82
Average	3.48	4.16	0.91	2.79
LG&E	8.35	6.58	1.06	2.54

Source: Schedule 17 through 28.

Exhibit
Carl G. K. Weaver
Revised Schedule 17

Cash Flow Analysis

Cinergy Corp (thousands of dollars)

2002 Average	717,849 996,199 857,024 567,099) (889,408) (1,228,254) 867,263 3,225 435,244 18,013 110,016 64,015	3.70 4.99 4.34 2.51 3.34 2.92 0.46 1.12 0.79 1. 62 2.76 2.19
2001	Cash Flow from Operating Activities Cash Flow from Investing Activities Cash Flow from Financing Activities Change in Cash Flow	Cash Flow Coverage of Interest Cash Flow Coverage of Total Dividends Cash flow Coverage of Investing Activities Quality of Earnings

Source: August 2003 Compact Disclosure

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Responses of the Attorney General's Witness Carl G. K. Weaver to Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335 Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

10. In reference to the 8 percent interest rate discussed at page 28, line 17, indicate the basis for using this level of interest rate.

Answer:

KU and LG&E have an A1 bond rating by Merchant (Moody's). Schedule 4 shows that in January through August 2003, average yields on public utility bonds have ranged from 6.13% to 7.58%. Schedule 5 shows that 10—year Treasury Bonds are expected to increase by 60 basis points in 2004 over 2003. Longer termed public bonds will increase by this or a greater amount in 2004. Therefore, 8% represents a reasonable estimate for assuming an increase in debt in 2004. Since it is higher than the rate at which KU and LG&E are currently obtaining debt capital, it also represents a conservative assumption.

Responses of the Attorney General's Witness

Carl G. K. Weaver to

Commonwealth of Kentucky PSC Case No. 2003-00334

And Case No. 2003-00335

Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

- 11. In reference to Schedules 29 and 30:
- For each factor that represents a 3-year average, provide the individual yearly figures for each company.
 - Explain how "Times Interest Earned" is calculated. b.
 - Provide the calculation of Times Interest Earned for DTE Energy, KU and LG&E.

Answer:

- A copy of the compact disclosure sheets that contain the data for each factor for each a. company.
- b. Earnings before interest and taxes divided by interest.

c.	<u>Company</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>	Avg.
	DTE	2.05	1.47	${2.42}$	1.98
	KU	6.74	5.52	4.74	5.67
	LG&E	5.83	5.49	5.05	5.46

Cinergy

KEY ANNUAL FINANCI	AL RATIOS		
KEY ANNUAL FINANCI FISCAL YEAR ENDING QUICK RATIO CURRENT RATIO SALES/CASH SG & A/SALES RECEIVABLES TURNOVER RECEIVABLES DAYS SALES INVENTORIES TURNOVER	12/31/2002	12/31/2001	12/31/2000
OUICK RATIO	0.50	0.39	0.38
CURRENT RATIO	0.85	0.66	0.77
SALES/CASH	53.51	116.32	85.36
SG & A/SALES	0.13	0.10	0.17
RECEIVABLES TURNOVER	9.15	11.57	5.11
RECEIVABLES DAYS SALES	39.33	31.11	70.40
INVENTORIES TURNOVER	37.03	53.91	52.10
THE PROPERTY OF THE CALLS	9 72	6.68	6.91
MED CATES/MODEING CAPITAL	-25.88	-12.19	-7.89
NOW CATECIDIANT C POITOMENT	1.37	1.58	1.22
NET SALES/CURRENT ASSETS	4.62 0.89 1,512,114	6.25	2.39
NET SALES/TOTAL ASSETS	0.89	1.05	0.67
NET SALES/EMPLOYEES	1,512,114	1,473,231	992,718
TOTAL LIAB/TOTAL ASSETS TOTAL LIAB/INVESTED CAPITAL TOTAL LIAB/COMMON EQUITY TIMES INTEREST EARNED	0.72	0.73	0.77
TOTAL LIAB/INVESTED CAPITAL	1.30	1.36	1.65
TOTAL LIAB/INVESTED CAPITAL TOTAL LIAB/COMMON EQUITY TIMES INTEREST EARNED CURRENT DEBT/EQUITY LONG TERM DEBT/EQUITY TOTAL DEBT/EQUITY TOTAL ASSETS/EQUITY PRETAX INC/NET SALES PRETAX INC/TOTAL ASSETS	3.23	3.41	3.40
TIMES INTEREST EARNED	3.23	3.70	3.94
CURRENT DEBT/EQUITY	0.06	0.05	0.01
LONG TERM DEBT/EQUITY	1.22	1.20	
TOTAL DEBT/EQUITY	1.27		
TOTAL ASSETS/EQUITY	3.96	4.09	
PRETAX INC/NET SALES	0.05		0.08
PRETAX INC/TOTAL ASSETS	0.04	0.06	
PRETAX INC/INVESTED CAPITAL	0.07	-	0.11
PRETAX INC/COMMON EQUITY	0.17		
NET INCOME/NET SALES	0.03	0.03	
NET INCOME/TOTAL ASSETS			0.03
NET INCOME/INVESTED CAPITAL	0.05	0.07	
NET INCOME/COMMON EQUITY	0.11	0.15	0.14

DTE

KEY ANNUAL FINANC	IAL RATIOS		
FISCAL YEAR ENDING	12/31/2002	12/31/2001	12/31/2000
QUICK RATIO	0.49	0.50	0.35
CURRENT RATIO	0.86		
SALES/CASH	18.24	13.63	
SG & A/SALES	0.41	0.36	0.37
RECEIVABLES TURNOVER	5.63	5.87	8.25
RECEIVABLES DAYS SALES	63.90	61.36	43.62
INVENTORIES TURNOVER	11.72	11.47	13.84
INVENTORIES DAYS SALES	30.72	31.39	26.00
NET SALES/WORKING CAPITAL	-15.03	-16.64	
NET SALES/PLANT & EQUIPMENT	0.69	0.61	0.63
NET SALES/CURRENT ASSETS	2.44	_	2.81
NET SALES/TOTAL ASSETS	0.35	0.31	
NET SALES/EMPLOYEES	608,128	525,023	507,218
TOTAL LIAB/TOTAL ASSETS	0.76	=	
TOTAL LIAB/INVESTED CAPITAL	2.19	2.16	1.07
TOTAL LIAB/COMMON EQUITY	3.21	3.11	2.16
TIMES INTEREST EARNED	2.05	1.47	· ·
CURRENT DEBT/EQUITY	NA	NA	0.07
LONG TERM DEBT/EQUITY	0.45	0.42	0.97
TOTAL DEBT/EQUITY	0.45	0.42	1.05
TOTAL ASSETS/EQUITY	4.21	4.11	3.16
PRETAX INC/NET SALES	0.08	0.04	0.10
PRETAX INC/TOTAL ASSETS	0.03	0.01	0.04
PRETAX INC/INVESTED CAPITAL	0.09	0.03	0.06
PRETAX INC/COMMON EQUITY	0.13	0.05	0.12
NET INCOME/NET SALES	0.09	0.06	0.10
NET INCOME/TOTAL ASSETS	0.03	0.02	0.04
NET INCOME/INVESTED CAPITAL	0.09	0.05	0.06
NET INCOME/COMMON EQUITY	0.14	0.07	0.12

FPL Group

KEY ANNUAL FINANCIA	AL RATIOS		
FISCAL YEAR ENDING	12/31/2002	12/31/2001	12/31/2000
QUICK RATIO	0.23	0.20	0.28
CURRENT RATIO	0.49	0.44	0.64
SALES/CASH	31.24	101.54	54.90
SG & A/SALES	0.27	0.24	0.26
RECEIVABLES TURNOVER	12.95	13.09	11.12
RECEIVABLES DAYS SALES	27.81	27.50	32.38
INVENTORIES TURNOVER	18.55	23.86	19.14
INVENTORIES DAYS SALES	19.41	15.09	18.81
NET SALES/WORKING CAPITAL	-4.15	-4.09	-7.21
NET SALES/PLANT & EQUIPMENT	0.58	0.71	0.71
NET SALES/CURRENT ASSETS	4.36	5.20	3.98
NET SALES/TOTAL ASSETS	0.42	0.48	0.46
NET SALES/EMPLOYEES	864,648	853,336	719,862
TOTAL LIAB/TOTAL ASSETS	0.67	0.64	0.62
TOTAL LIAB/INVESTED CAPITAL	1.06	1.01	0.97
TOTAL LIAB/COMMON EQUITY	2.06	1.87	1.70
TIMES INTEREST EARNED	4.02	4.58	4.74
CURRENT DEBT/EQUITY	0.02	0.01	NA
LONG TERM DEBT/EQUITY	0.88	0.78	0.68
TOTAL DEBT/EQUITY	0.89	0.78	0.68
TOTAL ASSETS/EQUITY	2.99	2.80	2.63
PRETAX INC/NET SALES	0.11	0.14	0.15
PRETAX INC/TOTAL ASSETS	0.05	0.07	0.07
PRETAX INC/INVESTED CAPITAL	0.08	0.10	0.11
PRETAX INC/COMMON EQUITY	0.15	0.19	0.19
NET INCOME/NET SALES	0.06	0.09	0.10
NET INCOME/TOTAL ASSETS	0.02	0.04	0.05
NET INCOME/INVESTED CAPITAL	0.04	0.07	0.07
NET INCOME/COMMON EQUITY	0.07	0.13	0.13

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KEY	ANNIIAT.	FINANCIAL	RATIOS

FISCAL YEAR ENDING	12/31/2002	12/31/2001	12/31/2000
QUICK RATIO	0.72	0.71	0.49
CURRENT RATIO	1.20	1.35	1.15
SALES/CASH	115.78	137.84	75.25
SG & A/SALES	0.30	0.31	0.31
RECEIVABLES TURNOVER	6.33	8.03	8.49
RECEIVABLES DAYS SALES	56.85	44.82	42.39
INVENTORIES TURNOVER	13.19	11.63	15.15
INVENTORIES DAYS SALES	27.29	30.94	23.76
NET SALES/WORKING CAPITAL	21.13	15.56	24.40
NET SALES/PLANT & EQUIPMENT	0.75	0.83	
NET SALES/CURRENT ASSETS	3.58	4.01	3.22
NET SALES/TOTAL ASSETS	0.55	0.61	0.57
NET SALES/EMPLOYEES	508,193	493,655	467,688
TOTAL LIAB/TOTAL ASSETS	0.63	0.59	0.33
TOTAL LIAB/INVESTED CAPITAL	0.93	0.85	0.49
TOTAL LIAB/COMMON EQUITY	1.70	1.45	0.49
TIMES INTEREST EARNED	4.82	4.14	4.01
CURRENT DEBT/EQUITY	NA	0.09	0.00
LONG TERM DEBT/EQUITY	0.83	0.71	NA
TOTAL DEBT/EQUITY	0.83	0.80	0.00
TOTAL ASSETS/EQUITY	2.70	2.45	1.49
PRETAX INC/NET SALES	0.14	0.13	0.13
PRETAX INC/TOTAL ASSETS	0.08	0.08	0.08
PRETAX INC/INVESTED CAPITAL	0.11	0.11	0.11
PRETAX INC/COMMON EQUITY	0.21	0.19	0.11
NET INCOME/NET SALES	0.08	0.08	0.08
NET INCOME/TOTAL ASSETS	0.05	0.05	0.05
NET INCOME/INVESTED CAPITAL	0.07	0.07	0.07
NET INCOME/COMMON EQUITY	0.13	0.12	0.07

Southern

KEY ANNUAL FINANCIAL RATIOS					
FISCAL YEAR ENDING	12/31/2002	12/31/2001	12/31/2000		
QUICK RATIO	0.35	0.41	0.41		
CURRENT RATIO	0.59	0.68	0.76		
SALES/CASH	38.64	28.69	49.10		
SG & A/SALES	0.25	0.24	0.24		
RECEIVABLES TURNOVER	7.00	7.12	7.67		
RECEIVABLES DAYS SALES	51.39	50.59	46.92		
INVENTORIES TURNOVER	12.59	10.76	14.34		
INVENTORIES DAYS SALES	28.60	33.47	25.11		
NET SALES/WORKING CAPITAL	-5.15	-7.15	-11.27		
NET SALES/PLANT & EQUIPMENT	0.43	0.44	0.47_		
NET SALES/CURRENT ASSETS	3.56	3.44	3.56		
NET SALES/TOTAL ASSETS	0.33	0.34	0.32		
NET SALES/EMPLOYEES	402,972	NA	386,841		
TOTAL LIAB/TOTAL ASSETS	0.64	0.64	0.57		
TOTAL LIAB/INVESTED CAPITAL	1.15	1.16	0.97		
TOTAL LIAB/COMMON EQUITY	3.24	3,38	2.22		
TIMES INTEREST EARNED	3.70	3.25	2.90		
CURRENT DEBT/EQUITY	NA	NA	0.01		
LONG TERM DEBT/EQUITY	0.96	0.99	0.73		
TOTAL DEBT/EQUITY	0.96	0.99	0.74		
TOTAL ASSETS/EQUITY	3.53	3.58	2.92		
PRETAX INC/NET SALES	0.17	0.17	0.16		
PRETAX INC/TOTAL ASSETS	0.06	0.06	0.05		
PRETAX INC/INVESTED CAPITAL	0.10	0.10	0.09		
PRETAX INC/COMMON EQUITY	0.21	0.21	0.15		
NET INCOME/NET SALES	0.12	0.12	0.13		
NET INCOME/TOTAL ASSETS	0.04	0.04	0.04		
NET INCOME/INVESTED CAPITAL	0.07	0.08	0.07		
NET INCOME/COMMON EQUITY	0.15	0.16	0.12		

Constellation

KEY ANNUAL FINANCI	AL RATIOS		
FISCAL YEAR ENDING	12/31/2002	12/31/2001	12/31/2000
QUICK RATIO	0.96	0.28	0.63
CURRENT RATIO	1.33	0.53	0.77
SALES/CASH	6.80	15.48	4.57
SG & A/SALES	0.06	0.12	0.06
RECEIVABLES TURNOVER	3.77	5.25	4.76
RECEIVABLES DAYS SALES	95.48	68.58	75.60
INVENTORIES TURNOVER	14.03	12.11	16.45
INVENTORIES DAYS SALES	25.65	29.74	21.89
NET SALES/WORKING CAPITAL	6.95		-6.27
NET SALES/PLANT & EQUIPMENT	0.59	0.50	0.57
NET SALES/CURRENT ASSETS	1.74	2.05	1.91
NET SALES/TOTAL ASSETS	0.33		0.29
NET SALES/EMPLOYEES	540,575	421,609	483,897
TOTAL LIAB/TOTAL ASSETS	0.71	0.71	0.74
TOTAL LIAB/INVESTED CAPITAL	1.15	1.48	1.47
TOTAL LIAB/COMMON EQUITY	2.65	2.67	3.02
TIMES INTEREST EARNED	4.11	1.53	3.23
CURRENT DEBT/EQUITY	0.11	0.35	0.27
LONG TERM DEBT/EQUITY	1.14	0.67	0.94
TOTAL DEBT/EQUITY	1.24	1.02	1.21
TOTAL ASSETS/EQUITY	3.49	3.50	3.85
PRETAX INC/NET SALES	0.18	0.03	0.15
PRETAX INC/TOTAL ASSETS	0.06	0.01	0.04
PRETAX INC/INVESTED CAPITAL	0.10	0.02	0.09
PRETAX INC/COMMON EQUITY	0.22	0.03	0.18
NET INCOME/NET SALES	0.11	0.02	0.09
NET INCOME/TOTAL ASSETS	0.04	0.01	0.03
NET INCOME/INVESTED CAPITAL	0.06	0.01	0.05
NET INCOME/COMMON EQUITY	0.14	0.02	0.11

Empur

KEY ANNUAL FINANC	IAL RATIOS			
FISCAL YEAR ENDING	12/31/2002	12/31/2001	12/31/2000	
JOICK KALIU	0.52		0.16	
CURRENT RATIO	1.08	0.50	0.41	
SALES/CASH	21.19	23.24		
SG & A/SALES	0.19		0.17	
RECEIVABLES TURNOVER	9.70		13.11	
RECEIVABLES DAYS SALES	37.11	41.45	27.46	
INVENTORIES TURNOVER	9.80	13.23	17.94	
INVENTORIES DAYS SALES	36.75	27.21	20.07	
NET SALES/WORKING CAPITAL	42 72	-3 77	-3.24	
NET SALES/PLANT & EQUIPMENT	0.00			
NET SALES/CURRENT ASSETS	3.23	3.77	4.71	
NET SALES/TOTAL ASSETS	0.32	0.30	0.32	
NET SALES/CURRENT ASSETS NET SALES/TOTAL ASSETS NET SALES/EMPLOYEES TOTAL LIAB/TOTAL ASSETS TOTAL LIAB/INVESTED CAPITAL	386,241	431,527	433,982	
TOTAL LIAB/TOTAL ASSETS	0.61	0.64	0.71	
O. W. # I.I.D	0.03	0.99	1.04	
TOTAL LIAB/COMMON EQUITY	2.12	2.62		
TIMES INTEREST EARNED	2.26			
TIMES INTEREST EARNED CURRENT DEBT/EQUITY LONG TERM DEBT/EQUITY TOTAL DEBT/EQUITY	NA	0.14	0.08	
TONG TERM DEBT/EQUITY	1.09	1.15	1.36	
TOTAL DEDIT LOCATIA	1.09		1.44	
TOTAL ASSETS/EQUITY	2.95	3.32	3.46	
PRETAX INC/NET SALES	0.13	0.04	0.13	
PRETAX INC/TOTAL ASSETS	0.04		0.04	
PRETAX INC/INVESTED CAPITAL	0.06	0.02	0.06	
PRETAX INC/INVESTED CAPITAL PRETAX INC/COMMON EQUITY NET INCOME/NET SALES NET INCOME/TOTAL ASSETS	0.12	0.04	0.15	
NET INCOME (TOWN) A GOTTO	0.08	0.04		
	0.03	0.01	0.03	
NET INCOME/INVESTED CAPITAL NET INCOME/COMMON EQUITY		0.02	0.04	
THEORIEN COMMON FOLLLY	0.08	0.04	0.10	

KEY ANNUAL FINANCIA FISCAL YEAR ENDING QUICK RATIO CURRENT RATIO SALES/CASH SG & A/SALES RECEIVABLES TURNOVER RECEIVABLES DAYS SALES INVENTORIES DAYS SALES INVENTORIES DAYS SALES NET SALES/WORKING CAPITAL NET SALES/PLANT & EQUIPMENT NET SALES/CURRENT ASSETS NET SALES/TOTAL ASSETS NET SALES/EMPLOYEES TOTAL LIAB/TOTAL ASSETS TOTAL LIAB/INVESTED CAPITAL TOTAL LIAB/COMMON EQUITY	0.53 0.89 14.03 0.15 9.28 38.78 31.40 11.47 -27.32 0.63 3.34 0.39 440,134 0.67 1.03 2.11	0.08 15.92 22.62 64.13 5.61 117.10 1.33 6.64 0.80 874,698 0.64 0.95	0.95 1.40 14.96 0.11 6.76 53.27 44.64 8.06 11.23 1.00 3.18 0.56 604,152 0.67 1.03 2.16
TIMES INTEREST EARNED CURRENT DEBT/EQUITY LONG TERM DEBT/EQUITY TOTAL DEBT/EQUITY TOTAL ASSETS/EQUITY PRETAX INC/NET SALES PRETAX INC/TOTAL ASSETS PRETAX INC/INVESTED CAPITAL PRETAX INC/COMMON EQUITY NET INCOME/NET SALES NET INCOME/TOTAL ASSETS NET INCOME/TOTAL ASSETS NET INCOME/TOTAL ASSETS NET INCOME/TOTAL ASSETS	2.58 NA 0.99 0.99 3.07 0.08 0.03 0.05 0.10 0.05 0.02	NA 0.93 0.93 2.84 0.10 0.08 0.12 0.23 0.06 0.05	1.03 1.03 3.13 0.11 0.06 0.09 0.19 0.06 0.03 0.05

Progress

KEY ANNUAL FINANCIAL RATIOS	
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FISCAL YEAR ENDING QUICK RATIO CURRENT RATIO SALES/CASH SG & A/SALES RECEIVABLES TURNOVER	12/31/2002	12/31/2001	12/31/2000	
QUICK RATIO	0.37	0.30	0.18	
CURRENT RATIO	1.04	0.84	0.47	
SALES/CASH	129.49	150.54	37.21	
SG & A/SALES	0.22	0.20	0.25	
RECEIVABLES TURNOVER	8.26	8.26	4.07	
RECETANDERS DATS SAFES	44 61	47 59	99/1/	
INVENTORIES TURNOVER	9.08	9.28	8.95	
INVENTURIES DAYS SALES	39.67	38 81	40 23	
NET SALES/WORKING CAPITAL	65.18	-14.94	-1,25	
NET SALES/PLANT & EOUIPMENT	0.63	0.70		
NET SALES/CURRENT ASSETS	2.78 0.37 519,289	2.79		
NET SALES/TOTAL ASSETS	0.37	0.39	0.19	
NET SALES/EMPLOYEES TOTAL LIAB/TOTAL ASSETS	519,289	499,098	235,558	
TOTAL LIAB/TOTAL ASSETS	0.68	0.71	0.73	
TOTAL LIAB/INVESTED CAPITAL TOTAL LIAB/COMMON EQUITY	0.88	1.01	1.29	
TOTAL LIAB/COMMON EQUITY	2.18	2.46	2.74	
TIMES INTEREST EARNED	1.62	1.57	3.78	
CURRENT DEBT/EQUITY	0.04	0.11	0.03	
LONG TERM DEBT/EQUITY	1.44	1.41	1.09	
TOTAL DEBT/EQUITY	1.48	1.53	1.12	
TIMES INTEREST EARNED CURRENT DEBT/EQUITY LONG TERM DEBT/EQUITY TOTAL DEBT/EQUITY TOTAL ASSETS/EQUITY	3.15	3.43		
PRETAX INC/NET SALES	0.05	0.05	0.18	
PRETAX INC/TOTAL ASSETS	0.02	0.02	0.03	
PRETAX INC/INVESTED CAPITAL	0.02	0.03		
PRETAX INC/COMMON EQUITY	0.06	0.06	0.12	
NET INCOME/NET SALES	0.07	0.07	0.13	
NET INCOME/TOTAL ASSETS	0.02	0.03		
NET INCOME/INVESTED CAPITAL	0.03	0.04	0.04	
NET INCOME/COMMON EQUITY	0.08	0.09	0.09	

PRETAX INC/COMMON EQUITY

NET INCOME/TOTAL ASSETS

NET INCOME/COMMON EQUITY

NET INCOME/INVESTED CAPITAL

NET INCOME/NET SALES

KEY ANNUAL FINANCIAL RATIOS					
FISCAL YEAR ENDING	12/31/2002	12/31/2001	12/31/2000		
QUICK RATIO	0.14	0.21	0.38		
CURRENT RATIO	0.34	0.54	0.55		
SALES/CASH	164.76	260.84	2,713.19		
SG & A/SALES	0.18	0.15	0.15		
RECEIVABLES TURNOVER	17.91	18.98	9.42		
RECEIVABLES DAYS SALES	20.10	18.97	38.21		
INVENTORIES TURNOVER	19.27	19.81	22.24		
INVENTORIES DAYS SALES	18.68	18.17	16.19		
NET SALES/WORKING CAPITAL	-3.40	-8.07	-8.08		
NET SALES/PLANT & EQUIPMENT	0.51	0.54	0.54		
NET SALES/CURRENT ASSETS	6.63	6.98	6.51		
NET SALES/TOTAL ASSETS	0.44	0.47	0.49		
NET SALES/EMPLOYEES	938,921	852,651	3,407,764		
TOTAL LIAB/TOTAL ASSETS	0.57	0.58	0.59		
TOTAL LIAB/INVESTED CAPITAL	0.95	0.87	0.90		
TOTAL LIAB/COMMON EQUITY	1.41	1.43	1.54		
TIMES INTEREST EARNED	6.74	5.52	4.74		
CURRENT DEBT/EQUITY	0.18	0.07	0.08		
LONG TERM DEBT/EQUITY	0.41	0.56	0.61		
TOTAL DEBT/EQUITY	0.59	0.63	0.58		
TOTAL ASSETS/EQUITY	2.34	2.36	2.45		
PRETAX INC/NET SALES	0.17	0.18	0.17		
PRETAX INC/TOTAL ASSETS	0.07	0.08	0.08		
PRETAX INC/INVESTED CAPITAL	0.12	0.13	0.13		

0.18

0.11

0.05

0.08

0.11

0.21

0.11

0.05

0.08

0.13

0.22

0.11

0.05

0.08

0.14

KEY ANNUAL FINANCIAL RATIOS					
FISCAL YEAR ENDING	12/31/2002	12/31/2001	12/31/2000		
QUICK RATIO	0.14				
CURRENT RATIO	0.32	0.36	0.52		
SALES/CASH	60.31	471.92	150.12		
SG & A/SALES	0.22	0.19	0.16		
RECEIVABLES TURNOVER	14.99	11.63	5.76		
RECEIVABLES DAYS SALES	24.01	30.94	62.54		
INVENTORIES TURNOVER	11.81	14.57	15.42		
INVENTORIES DAYS SALES	30.47	24.71	23.34		
NET SALES/WORKING CAPITAL	-2.43	-2.94	+3.85		
NET SALES/PLANT & EQUIPMENT	0.48	0.49	0.52		
NET SALES/CURRENT ASSETS	5.05	5.25	3.59		
NET SALES/TOTAL ASSETS	0.40	0.41	0.44		
NET SALES/EMPLOYEES	1,151,722	1,098,897	1,404,924		
TOTAL LIAB/TOTAL ASSETS	0.64	0.62	0.61		
TOTAL LIAB/INVESTED CAPITAL	1.30	1.16	1.10		
TOTAL LIAB/COMMON EQUITY	1.96	1.81	1.74		
TIMES INTEREST EARNED	5.83	5.49	5.05		
CURRENT DEBT/EQUITY	0.31	0.26	0.28		
LONG TERM DEBT/EQUITY	0.35	0.40	0.41		
TOTAL DEBT/EQUITY	0.66	0.66	0.69		
TOTAL ASSETS/EQUITY	2.76	2.62	2.55		
PRETAX INC/NET SALES	0.14	0.17	0.18		
PRETAX INC/TOTAL ASSETS	0.06	0.07	0.08		
PRETAX INC/INVESTED CAPITAL	0.11	0.13	0.14		
PRETAX INC/COMMON EQUITY	0.17	0.20	0.22		
NET INCOME/NET SALES	0.09	0.11	0.11		
NET INCOME/TOTAL ASSETS	0.03	0.04	0.05		
NET INCOME/INVESTED CAPITAL	0.07	0.08	0.09		
NET INCOME/COMMON EQUITY	0.11	0.13	0.14		

Responses of the Attorney General's Witness Carl G. K. Weaver to

Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335

Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

- 12. In reference to Dr. Weaver's relative risk analysis on pages 36-37:
- a. In reaching the conclusion concerning the relative riskiness of KU and LG&E versus their respective comparison groups, did Dr. Weaver weight each factor equally?
 - b. If not, which factors were weighted more?
- c. If the factors were not weighted equally, provide the weights Dr. Weaver placed on each of the factors.

Answer:

- a. I did not perform a mathematical calculation in which I weighted the factors differently. An explanation of how I considered the factors is contained on page 36, lines 36 40; and on page 37, lines 1 10.
- b. See response to a.
- c. See response to a.

Responses of the Attorney General's Witness Carl G. K. Weaver to Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335 Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

- 13. In reference to Dr. Weaver's statement at page 42, lines 14-16 that the DCF constant growth model has greater use by participants in the capital market than the multi-stage DCF or the bond-yield-risk premium models:
- a. Provide all studies, documents, surveys, etc. relied upon by Dr. Weaver in making this statement.
- b. Does Dr. Weaver claim that the DCF constant growth model has greater use by participants in the capital market than the CAPM method? If so, provide all studies documents, surveys, etc. relied upon by Dr. Weaver to support this contention.

Answer:

- a. I reached this conclusion based upon my experience teaching finance courses in managerial finance and in capital markets analysis. The multi-stage DCF and bond-yield-risk premium models are not covered as well in financial text books as are the constant growth DCF and the CAPM models. A great deal of the financial literature that deals with cost of equity analysis deals with the CAPM model.
- b. No.

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Responses of the Attorney General's Witness Carl G. K. Weaver to Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335 Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

- 14. In reference to Dr. Weaver's statement at page 42, lines 20-22:
 - a. Define "quality of beta estimates."
- b. Provide all texts, financial journal articles, etc. relied upon by Dr. Weaver in making this statement.

Answer:

- a. The "quality of beta estimates" refers to how closely an estimate for beta actually measures an actual beta. An estimate that is close to its actual value has better quality.
- b. Attached is chapter 3 from Modern Portfolio Theory, The Capital Asset Pricing Model and Arbitrage Pricing Theory: A User's Guide, second Edition by Diana R. Harrington. The References at the end of the chapter provide an excellent resource for studies on the quality of beta.

apital Asset Pricing," Journal of 341-60.

ing Model," Journal of Fi-

glewood Cliffs, N.J.: Prentice-

Security Returns, 1931-1979," er 1982, p. 9.

ersification in a Three-Moment itative Analysis, 13 (December

other Opinion Regarding Diverof Financial Research, 6 (Spring

es and Equity Security Pricing," , 31-40.

nvestor, July 1980, pp. 23-30.

chapter

4

Estimating Beta

In Chapter 1 we defined beta as a measure of the relative volatility of returns: as the average rate of return from the market moves up and down, what happens to the returns for a given asset? If the asset's returns tend to move up and down more dramatically than do the market returns, the asset is considered relatively more volatile—more risky—and it will have a higher beta. In the capital asset pricing model, beta is the sole asset-specific or portfolio-specific factor. At any given time the forecasts for the risk-free rate and the market premium are the same for every asset or portfolio. Beta alone links the investor's expectations of returns from the asset or portfolio with his or her expectations of returns from the market. Because beta is such a crucial element in the CAPM, its estimation must be accurate.

In this chapter we will look at what we know about estimating beta. To develop a beta forecast, practitioners and academics often extrapolate from history often using some form of regression analysis. Using historical data and regression analysis presents two main problems. The first problem is determining the best way to capture the important information contained in history. In this chapter we will examine the various methods used to calculate beta from historical data. Specifically, we will look at the effect that using different time periods, indexes, risk-free rates, estimation techniques, and holding periods has on beta estimates.

The second problem is the uncertainty over whether a historical beta is useful in forecasting risk. This problem is usually labeled beta stability. We will look at whether changes in beta (its instability) are the result of statistical problems or whether changes in beta represent true changes in the underlying risk of the asset. Thus, we will attempt to answer the question, Is a historically based beta stable enough to use as a proxy for expectations? We will conclude the chapter by considering some of the innovative ways developed by academics and practitioners to get better approximations of investors' expectations of an asset's (usually a stock's) systematic risk. In particular, we will look at some attempts that have been made to discover the underlying determinants of beta and to use those factors to predict beta.

Once again, the discussion will neither describe every piece of research nor summarize every article. Rather, this chapter will provide examples of what seem to be some of the most interesting and relevant work that has been done in the area.

To have some idea of the difficulties in making beta estimates, we need only look at the differences among betas estimated by popular beta services. Beta services are commercially available lists of betas produced by investment advisory services. Most of the betas shown in Exhibit 4-1 are from beta services and were calculated using historical returns. The exceptions are those provided by Wilshire and Barr Rosenberg Associates. These services use other firm-related historical data to calculate betas. The stocks whose betas are shown were arbitrarily chosen from the available data. Southern California Edison is interesting in that, in 1974, it was estimated to have above-average risk by Merrill Lynch and average risk by Value Line, Rosenberg, and Wilshire. The exhibit vividly demonstrates just how different beta estimates can be from different services, for different stocks, and at different points in time.

We might question the usefulness of beta when such different estimates can be made at the same point in time. Peterson (1972) did so and compared the betas published by four commercial producers—Levy, Value Line, Merrill Lynch, and Oliphant. He ranked the betas from each source and provided the rank-order correlations shown in Exhibit 4–2. A perfect correlation would be 1.00, and that would imply that each stock is ranked by the first service precisely as it is ranked by the second. Any correlation of less than 1.00 shows less than perfect agreement among the advisory services. Thus, we can see from Exhibit 4–2 that Merrill Lynch and Levy estimate the same ranking (but not the same beta) 56 percent of the time. Thus, not only beta but beta rankings can vary from one service to another.

It is important to note at this point that the behavior of beta is of interest to those who wish to test the ability of beta to explain returns

Exhibit 4-1
Betas Calculated by Investment Services for Selected Stocks

Barr Rosenberg Short-Term JANUARY 1974 Market Model ver whether a historical beta sually labeled beta stability. bility) are the result of represent true changes will attempt to answer the enough to use as a proxy for by considering some of the d practitioners to get better an asset's (usually a stock's) at some attempts that have minants of beta and to use

describe every piece of rethis chapter will provide exest interesting and relevant

making beta estimates, we sestimated by popular beta ilable lists of betas produced e betas shown in Exhibit 4-using historical returns. The and Barr Rosenberg Associhistorical data to calculate were arbitrarily chosen from son is interesting in that, in ge risk by Merrill Lynch and Wilshire. The exhibit vividly terman be from different series; in time.

beta when such different estime. Peterson (1972) did so ommercial producers—Levy, eranked the betas from each tions shown in Exhibit 4-2. would imply that each stock is ranked by the second. Any in perfect agreement among om Exhibit 4-2 that Merrill is (but not the same beta) 56 beta rankings can vary from

nat the behavior of beta is of ty of beta to explain returns

Exhibit 4-1

Betas Calculated by Investment Services for Selected Stocks

JANUARY 1974

					3	9.0		
						Barr Rosenberg	.	
	,					Short-Term	Long-Term	
	Merril	Merrill-Lynch	Marke	Market Model		Fundamen-	Fundamen-	
	(Adj	(Adjusted)	(Adjı	(Adjusted)	Historical	tal	ta	Value Lin
American Airlines	2.04	(1.69)	2.11	(1.01)	2.12	2.35	2.22	2.26
American Cyanamid	0.99	(1.00)	0.97	(0.98)	0.98	1.01	1.03	1.08
Houston Industries	1.08	(1.05)	1.12	(1.00)	1.21	1.12	1.10	0.77
San Diego Gas and Electric	0.99	(0.99)	96.0	(0.99)	1.03	0.87	0.90	0.73
Southern California Edison	1.33	(1.22)	1.33	(1.02)	1.32	0.99	0.99	0.98
				DE	DECEMBER 1972	2		
American Airlines	1.53	(1.35)	1.15	(0.77)	1.41	1.67	1.60	1.45
American Cyanamid	1.04	(0.84)	0.84	(0.76)	0.95	0.95	0.98	1.15
Houston Industries	1.00	(1.00)	69.0	(0.73)	1.05	1.08	0.98	06.0
San Diego Gas and Electric	0.61	(0.74)	0.48	(0.66)	0.65	0.82	0.88	0.70
Southern California Edison	0.72	(0.81)	0.52	(0.67)	0.72	0.82	0.84	0.80

ne

Diana P. Harrington, "Whose Beta Is Best?" Financial Analysts Journal, 39 (July-August 1983),

	LEVY	VALUE LINE	MERRILL LYNCH	OLIPHANT
Levy	1.00	.61	.56	.48
Value Line		1.00	.77	.74
Merrill Lynch			1.00	.85
Oliphant		*		1.00

Source: D. Peterson, "Suggests Caution in the Use of Betas," Financial Analysts Journal, 28 (May-June 1972), 104.

(particularly realized returns), to forecast rates of return, or to evaluate investment portfolios. A review of the assumptions described in Chapter 2 shows that beta is present in the CAPM, but only as a measure of systematic risk—we do not have to restrict the behavior of beta to derive the CAPM.

I. BETA BASICS

Returns for any security are not "caused" by the market. Rather, returns are driven by macroeconomic events. The effect that these economic events have on investors' expectations will depend on three main factors:

- 1. The responsiveness of the asset's or portfolio's returns to economic events. This responsiveness is measured as the covariance of the asset's rate of return with that of the market [covariance (R_n, R_m)].
- 2. The relationship of the firm's basic characteristics (such as its debt level) with the average characteristics of firms in the market [covariance $(R_{jj}R_{m})$].
- 3. The general uncertainty attached by investors to macroeconomic events (such as changes in the level of oil prices), described as the variance of the market (R_m) .

The expected beta for a firm will change if any of the underlying relationships change. For example, if the firm increases its leverage relative to that of the market or undertakes unusually risky ventures, the change would be a real change in the systematic risk of the firm and should be effected in beta.

Estimating Beta

Mathematically, beta is

$$\beta_j = \frac{\text{coval}}{\text{va}}$$

where

variance (R_m) = the uncertainty

covariance (R_j, R_m) = the respon (R_j) to thos rate of ret (R_m)

i =an asset, s

m =the marke

Covariance itself is defined a

where

 $\rho_{jm} = \text{the correlation coefficien}$ returns of j with the retu $\sigma = \text{the standard deviation o}$

The mathematical relationship is pectational. Much of the difficult come as a result of compromise—pectational factors. Most often tionship of the stock's rate of recommon stock returns.

Using common stock return using an index that represents of further compromise. The marker risky assets, but common stocks verse. While Chapter 6 will discuis useful to note that since dat machine-readable form and thus ies, much of the focus of CAPA toward explaining common stock

Basic Regression Technique

The simplest way to examine th turns from any asset and those relationship over time. Exhibit

Item 14, page 5

Mathematically, beta is

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where

variance (R_m) = the uncertainty attached to economic events

 $\beta_j = \frac{\text{covariance } (R_j, R_m)}{\text{variance } (R_m)}$

covariance (R_j, R_m) = the responsiveness of an asset's rate of return (R_j) to those things that also change the market's

rate of return

i =an asset, stock, or portfolio

m =the market

 (R_m)

Covariance itself is defined as $\rho_{jm}, \sigma_j, \sigma_m$

where

 ρ_{jm} = the correlation coefficient, a measure of the correlation of the returns of j with the returns of m

 σ = the standard deviation of the returns

The mathematical relationship is fairly simple, but each variable is expectational. Much of the difficulty we have had in estimating beta has come as a result of compromise—of our using inadequate proxies for expectational factors. Most often the proxy has been the historical relationship of the stock's rate of return to that of a broad-based index of common stock returns.

Using common stock returns represents a major compromise, and using an index that represents only a portion of the stock market is a further compromise. The market portfolio should be a collection of all risky assets, but common stocks represent only one portion of the universe. While Chapter 6 will discuss this problem further, at this point it is useful to note that since data on common stock returns comes in machine-readable form and thus lends itself to use in computerized studies, much of the focus of CAPM empirical research has been directed toward explaining common stock returns.

Basic Regression Technique

The simplest way to examine the historical relationship between the returns from any asset and those from the market is simply to plot the relationship over time. Exhibit 4-3 illustrates this method. At every

ons .crrill Lynch Oliphant

.56 .48 .77 .74 1.00 .85 1.00

Financial Analysts Journal, 28 (May-

tes of return, or to evaluate aptions described in Chapter I, but only as a measure of he behavior of beta to derive

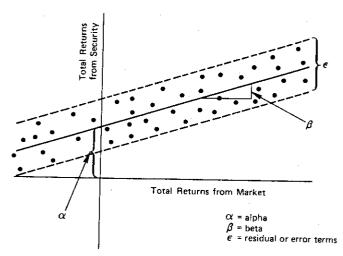
the market. Rather, returns effect that these economic

lepend on three main factors:

plio's returns to economic as \square as the covariance of the market [covariance (R_j, R_m)]. Characteristics (such as its debtics of firms in the market [co-

y investors to macroeconomic of oil prices), described as the

any of the underlying relacreases its leverage relative y risky ventures, the change of the firm and should be



point in time (every interval), the return from the asset and that from the market are represented by a dot on the chart. To convert all the dots to a more manageable descriptive relationship, we could fit a line to the data. This line is called the *security characteristic line*. Now we can describe the relationship by using the formula for a line (y = a + bx), the relationship that most of us learned in eighth-grade geometry.

The best-fitting line is one that will minimize the distance that each dot is from the line—the line that minimizes the squared errors. Thus, the method is called a *least-squares regression*. The intercept (a in the formula) is the minimum return from the asset if the return from the market were zero. The slope (b) is the incremental return expected from the asset as the market return becomes higher or lower.

Although this is the basic regression technique, those estimating beta from history use a somewhat more elegant version of the formula for a straight line. This version is called the *market model* and is written as follows:²

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \epsilon_j$$

'Here we have plotted the total returns from the market and the asset. If we had plotted the excess returns, each asset's and the market's returns less the risk-free rate of return, the line would have gone through the origin and the alpha would have been zero.

This is the total return version of the market model. It can also be written $R_{ji}-R_{ji}=\alpha_j+\beta_j(R_{mi}-R_{ji})+\epsilon_{ji}$, which is the risk-premium version, where R_j would be the risk-free rate of return.

Estimating Beta

where

 $R = \text{total returns}^3$

j = a firm or portfolio

t =the time period

m =the market.

α = the intercept (or alpha) of the return from the asset where firms and over time the intercept.

ϵ = the errors or the residuals without any remaining inf

 β = the systematic risk (beta),

Because the market model many people presume that they model does not rely on any of the It simply states that the returns ship between the returns from the

In relying on historical dar that history is an accurate predi or may not be true. Just how us on this question, let us look at market model.

Exhibit 4-4 shows the rest (using the S&P 500 as a proxy) a capital gains) from American Tel uary 1974 to December 1979. C sented by a dot. We could use o line to the dots. Mathematically

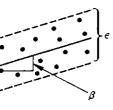
 $R_{ATT} =$

Exhibit 4-5 provides the sa 1984. This plot does not follow th plot followed. It would be much However, using the linear-regre simplest calculators, we can calc

³Least-squares analysis works be are normally distributed. Unfortunately returns tend to be nonnormal.

Itam 14, page 7

₹.ine



rom Market

α = alpha

 β = beta

 ϵ = residual or error terms

rom the asset and that from chart. To convert all the dots thip, we could fit a line to the steristic line. Now we can deta for a line (y = a + bx), the ath-grade geometry.

nimize the distance that each ses the squared errors. Thus,

The intercept (a in the st if the return from the emental return expected from gher or lower.

technique, those estimating egant version of the formula market model and is written

 $+ \epsilon_j$

the market and the asset. If we had set's returns less the risk-free rate of and the alpha would have been zero. Let model. It can also be written premium version, where R_{ℓ} would be

where

 $R = \text{total returns}^3$

j = a firm or portfolio

t =the time period

m =the market

 α = the intercept (or alpha) of the linear regression: the minimum return from the asset when the market return was zero (over all firms and over time the intercept should equal 0)

 ϵ = the errors or the residuals (assumed to be normally distributed without any remaining information)

 β = the systematic risk (beta), the slope of the line

Because the market model and the CAPM look remarkably alike, many people presume that they are the same. They are not. The market model does not rely on any of the assumptions inherent in the CAPM. It simply states that the returns-generating process is a linear relationship between the returns from the asset and the returns from the market.

In relying on historical data, these regression techniques assume that history is an accurate predictor of the future. The assumption may or may not be true. Just how useful is history? To get some perspective on this question, let us look at two sets of betas calculated using the market model.

Exhibit 4-4 shows the results of plotting the total market returns (using the S&P 500 as a proxy) against the total returns (dividends plus capital gains) from American Telephone and Telegraph (AT&T) from January 1974 to December 1979. Once again, each piece of data is represented by a dot. We could use our own judgment or a computer to fit a line to the dots. Mathematically, the resulting line would be

$$R_{ATT} = 0.432 + 0.575 (R_m)$$

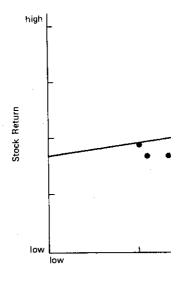
Exhibit 4-5 provides the same sort of data for AT&T from 1980 to 1984. This plot does not follow the distinct pattern that the earlier AT&T plot followed. It would be much more difficult to fit a line confidently. However, using the linear-regression package available on all but the simplest calculators, we can calculate a beta. The question is, How useful

³Least-squares analysis works best when the independent and dependent variables are normally distributed. Unfortunately, both the risk-free rates of return and the market returns tend to be nonnormal.

Estimating Beta

Returns of AT&T vs. F

E:



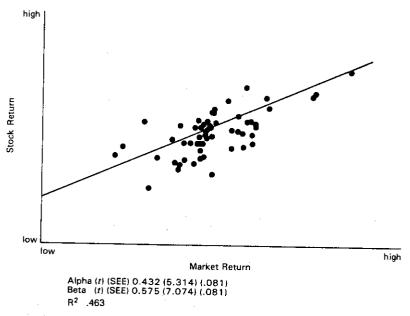
Alpha (t) (SEE) 0.819 (Beta (t) (SEE) 0.183 (R² .059

Durbin-Watson test). We can a the dependent variable (here, c independent variable (the mark the data. The measure that des ficient of determination, or R^2 . I cident with market-return chaplanatory power would result in 4-4 and 4-5, the more disperse

The earlier AT&T data hat the line. AT&T's R^2 of 0.46 is undata for the early 1980s, hower is very low. This figure means AT&T's returns during this per

For a simple description of these example, S. E. Wheelwright and S. Mal ed. (New York: John Wiley Interscience

Exhibit 4-4
Returns of AT&T vs. Returns of S&P 500, 1974-79



are these AT&T data in making a forecast for the future? And how useful were the earlier AT&T data? Clearly, changes in the AT&T returns had a closer relationship to changes in the market returns from 1974 to 1979 than they did from 1980 to 1984.

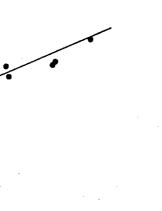
We need not look solely at the plotted data to determine the quality of the results. Using some simple tests, we can tell a great deal about the quality of the regression results. For instance, we can estimate the standard error of the estimated (SEE) beta or alpha. The standard error is like a standard deviation and gives us some idea of how much in error our estimate may be. For instance, if we had a beta of 0.80 and a standard error of 0.3, we could be more than 99 percent confident that the true beta lay in the range of 1.70 to -0.10.4

Furthermore, we can also determine the degree of confidence we have in the alpha, the beta, and the entire regression (the t and F tests) and can determine whether important factors have been omitted (the

 4 This is ± 3 standard deviations from the mean. Basic statistics and finance texts provide explanations of the normal distribution and the use of standard deviation.

Item 14, page 9

500, 1974-79



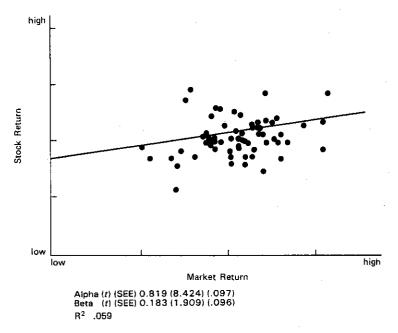
the future? And how useful in the AT&T returns had a returns from 1974 to 1979

determine the quality can tell a great deal about tance, we can estimate the ralpha. The standard error e idea of how much in error beta of 0.80 and a standard ent confident that the true

the degree of confidence we gression (the t and F tests) rs have been omitted (the

Basic statistics and finance texts use of standard deviation.

Exhibit 4-5
Returns of AT&T vs. Returns of S&P 500, 1980-84



Durbin-Watson test). We can also describe how much of the activity of the dependent variable (here, our stock returns) was explained by the independent variable (the market returns)—that is, how well the line fits the data. The measure that describes this association is called the *coefficient of determination*, or R^2 . If all the stock-return variation were coincident with market-return changes, the R^2 would be 1.00. Smaller explanatory power would result in a lower R^2 . As you can see in Exhibits 4-4 and 4-5, the more dispersed the dots, the lower the R^2 .

The earlier AT&T data have a very good fit; the points are close to the line. AT&T's R^2 of 0.46 is unusually high for a single stock. The AT&T data for the early 1980s, however, are widely spread and the R^2 of 0.06 is very low. This figure means that almost none of the movements of AT&T's returns during this period were related to market changes. This

⁵For a simple description of these test procedures, see basic statistics textbooks, for example, S. E. Wheelwright and S. Makridakis, *Forecasting Methods for Management*, 2d ed. (New York: John Wiley Interscience, 1980).



Chapter 4

makes sense. During the early 1980s, AT&T underwent major changes. Its regulated businesses—with the exception of its long-distance business—were divested, its other markets were opened to significant competition, and the investing public became uncertain about what effect these changes would have on the company. While the divestment did not occur until January 1984, the fact that such a divestiture would occur was known much earlier. Thus, over this period, virtually all the returns were determined by nonsystematic factors and events. History provided some information about AT&T prior to 1980 but few clues about AT&T's future systematic risk in 1984.

The AT&T example is one that is especially interesting. Prior to the order to restructure itself, AT&T's stock had one of the most stable betas of all companies. It was a textbook example. If, however, in the early 1980s, you had used history to predict the future, without knowledge of the changed circumstances of the company, you could have made a major error.

The beta calculated for an average stock has an R^2 of about 0.30. Perhaps we should be pleased that the market "explains" as much as 30 percent of the variance of a typical stock. By itself, this finding is significant but not surprising. Nevertheless, at least 70 percent remains to be explained. The question is, What else drives the price of individual securities? This question will be addressed later in this chapter, for we have not completed our examination of the problems in estimating beta from the history of returns.

Practical Problems in Regression Methodology

As we have seen, one of the conceptual problems in using regression analysis is the assumption that historical data can help us predict the future. But the technique also has some practical problems: the results can vary widely, depending on our choice of input data.

In early work, Jacob (1971) found that betas generated using the market model depended on three factors: the historical period over which the beta was estimated, the average market return during the period studied, and whether the investor actually used the market model as a method for estimating betas. Since Jacob's work, several other factors have been identified: the market proxy chosen, the measurement intervals used within the holding period, and the form of the market model used. To calculate a historical beta, we must make choices for each of these factors. Let us look at the differences that can result when different choices are made for each factor.

Estimating Beta

Measurement period

The length of time over wh measurement or holding period tically significant sample, but it mation that does not reflect the future.

What is the effect of differ Lerner (1972) looked specifically for a number of stocks by using sion), with monthly intervals. E using the New York Stock Exchichange significantly as the holdiresults for other firms.

One further demonstration from the C. I. Mortgage Group ruptcy, Peseau (1977) calculated expect the beta for 1971-74 and cause the latter period includes 7, however, demonstrates that the from that for 1971-75. Of cours 74 beta makes us suspicious of the periods with higher R^2 s is, nonet

E

Empirical Bet

HOLDING PERIOD IN MONTH 6 12 18 24 30 36 42 48 54 60 66 72 78 84

Source: W. J. Breen and E. H. Lerner, "On to f Economics and Management Science, Autu

Item 14, page 11

I underwent major changes.

on of its long-distance busined to significant compraints about what effect. While the divestment did not had ivestiture would occur iod, virtually all the returns nd events. History provided but few clues about AT&T's

ally interesting. Prior to the one of the most stable betas le. If, however, in the early ature, without knowledge of you could have made a major

ck has an R^2 of about 0.30. et "explains" as much as 30 By itself, this finding is sigleast 70 percent remains to rives the price of individual later in this chapter, for we problems in estimating beta

a using regression analm nelp us predict the future, oblems: the results can vary ca.

betas generated using the historical period over which et return during the period used the market model as a work, several other factors sen, the measurement interes form of the market model at make choices for each of that can result when different

Measurement period

The length of time over which we calculate beta is important. The measurement or holding period must be long enough to allow a statistically significant sample, but it must not be so long as to include information that does not reflect the relationships likely to persist into the future.

What is the effect of different holding-period choices? Breen and Lerner (1972) looked specifically at this question. They calculated betas for a number of stocks by using the market model (simple linear regression), with monthly intervals. Exhibit 4-6 shows their results for IBM using the New York Stock Exchange Index for "the market." The betas change significantly as the holding period lengthens. They found similar results for other firms.

One further demonstration of the problem is of interest. Using data from the C. I. Mortgage Group, a firm that eventually declared bankruptcy, Peseau (1977) calculated betas for overlapping periods. We would expect the beta for 1971–74 and that for 1971–75 to be very similar because the latter period includes only one more year of data. Exhibit 4–7, however, demonstrates that the beta for 1971–74 differs dramatically from that for 1971–75. Of course, the low R^2 associated with the 1971–74 beta makes us suspicious of the 1971–74 results. The beta shift among periods with higher R^2 s is, nonetheless, dramatic.

Exhibit 4–6
Empirical Beta Estimates for IBM

HOLDING PERIOD IN MONTHS	ALPHA	BETA
6	0.0079	2.2001
12	0.0251	1.1911
18	0.0394	0.9093
24	0.0398	1.0746
30	0.0847	0.7515
36	0.1241	0.5575
42	0.1453	0.4886
48	0.1293	0.3798
54	0.1384	0.4603
60	0.1889	0.4745
66	0.1418	0.8779
72	0.1295	0.7903
78	0.1508	0.4942
84	0.1209	0.6196

Source: W. J. Breen and E. H. Lerner, "On the Use of Beta in Regulatory Proceedings," Bell Journal of Economics and Management Science, Autumn 1972, p. 620.

Exhibit 4-7
Betas for C. I. Mortgage Group

TIME PERIOD	INTER- CEPT TERM	(t-VALUE)	BETA	(t-VALUE)	R²
1971-73	013	(38)	0.6	(1.96)*	.17
1971-74	045	(-1.96)	0.6	(1.29)	.04
1971-75	.010	(43)	2.6	(4.28)*	.32
1972-75	008	(29)	3.0	(4.69)*	.35
1972-76	016	(63)	3.0	(4.89)*	.33

*Indicates significance.

Source: D. Peseau, "Direct Testimony before the Public Utility Commissioner, State of Oregon in the Matter of Portland General Electric Co." (Oregon Docket No. UF-3339, September 1977).

The length of the holding period does affect the beta. Again, the bad news is that the CAPM does not help us in choosing the appropriate holding period. History, as always, is a difficult proxy for the future. Alexander and Chervany (1980), studying beta stability, estimated the optimal interval over which to calculate a beta. Using data from 1950-67, they found smaller absolute errors were associated with a six-year horizon, although they were insignificantly different from four years, as shown in Exhibit 4-8. While these results are, of course, subject to verification for different time periods and samples, many had previously believed, from a statistical point of view, that the longer the period the better the beta.

Interval choice

The length of the intervals within the chosen holding period can affect the beta estimate. For instance, we might use weekly, monthly, quarterly, or annual intervals within the chosen period. Many experts contend that the interval is irrelevant; however, Levhari and Levy (1977) demonstrated that the betas estimated using different intervals are different. Using data from 1948–68, they calculated betas for a number of stocks using intervals of from 1 to 30 months. Their results are shown in Exhibit 4–9. The betas for most of the stocks change considerably as the interval lengthens. Others, for instance Phillips and Segal (1975), found similar results.

⁶For different results see, for instance, Nicholas Gonedes, "Evidence on the Information Content of Accounting Numbers: Accounting-Based and Market-Based Estimates of Systematic Risk," *Journal of Financial and Quantitative Analysis*, 8 (June 1973), 407-43; and Jerome Baesel, "On the Assessment of Risk: Some Further Considerations," *Journal of Finance*, 29 (December 1974), 1491-94.

Means and Absolu

Ex

PENTILE	1 Year	2 Y
1: Mean	-2.2891	-1.
MAD	2.4978	2.
2: Mean	6746	
MAD	1.2616	1.
3: Mean	.0147	
MAD	1.1390	1.
4: Mean	.6190	
MAD	1.4024	1.
5: Mean	2.1760	1.
MAD	2.5991	2.
Overall:		
Mean	0308	
MAD	1.7800	1.
H Tests:		
Mean	1135.22*	2
MAD	453.35*	1

*Significant at the 5 percent level. Source: Gordon J. Alexander and N. L. Cherof Financial and Quantitative Analysis, 15 (M

More recently, Hawawini () triweekly, and monthly betas c Exhibit 4-10 he found them to I as to why this occurred. He beli shares had large market values the interval was shortened. Beta ket values would decline as the ment had to do with whether th

Perhaps even more interest problem that was first discoversion hearing considering the (COMSAT). In that case, two exp SAT that would be used to est mating COMSAT's cost of equi interval (monthly) and the same estimates were not the same. Thered, was that one had used dat calculate beta, whereas the other

A beta can be very sensiti

Group

BETA	(t-VALUE)	R ²
0.6	(1.96)*	.17
0.6	(1.29)	.04
2.6	(4.28)*	.32
3.0	(4.69)*	.35
3.0	(4.89)*	.33

cility Commissioner, State of Oregon in the UF-3339, September 1977).

es affect the beta. Again, the is in choosing the appropriate difficult proxy for the future. beta stability, estimated the eta. Using data from 1950–67, associated with a six-year horidifferent from four years, as are, of course, subject to verioles, many had previously bette longer the period the bet-

e might use weekly, monthly, chosen period. Many experts ever, Levhari and Levy (1977) ing different intervals are difficulated betas for a number of other. Their results are shown stocks change considerably as ce Phillips and Segal (1975),

as Gonedes, "Evidence on the Inforg-Based and Market-Based Estimates titative Analysis, 8 (June 1973), 407–Some Further Considerations," Jour-

Exhibit 4-8
Means and Absolute Errors-Beta Forecasts

		ESTIM	ATION INTE	RVAL	
PENTILE	1 Year	2 Years	4 Years	6 Years	9 Years
1: Mean	-2.2891	-1.7272	-1.2204	4833	3740
MAD	2.4978	2.1435	1.7078	.7805	1.1480
2: Mean	6746	2531	- 2869	3599	0235
MAD	1.2616	1.0734	1.2523	7221	1.1764
3: Mean	.0147	1088	1982	0732	.4374
MAD	1.1390	1.1751	1.4893	.6650	1.5144
4: Mean	.6190	.5123	.1920	.2487	.1622
MAD	1.4024	1.4212	1.6673	.8802	1.6028
5: Mean	2.1760	1.0354	.5002	.8189	1.7987
MAD	2.5991	2.0068	1.7991	1.0149	2.3389
Overall:					
Mean	0308	1083	2027	0302	.4002
MAD	1.7800	1.5640	1.5831	.8125	1.5561
H Tests:					
Mean	1135.22*	295.21*	63.84*	67.19*	29.86*
MAD	453.35*	108.84*	17.61*	14.20*	24.07*

*Significant at the 5 percent level.

Source: Gordon J. Alexander and N. L. Chervany, "On the Estimation and Stability of Beta," Journal of Financial and Quantitative Analysis, 15 (March 1980), 129.

More recently, Hawawini (1983) estimated daily, weekly, biweekly, triweekly, and monthly betas over the period 1970-73. As shown in Exhibit 4-10 he found them to be quite different. Hawawini speculated as to why this occurred. He believed that, in general, companies whose shares had large market values would have betas that would increase as the interval was shortened. Betas of companies with smaller equity market values would decline as the interval shortened. In part, this movement had to do with whether their betas led or lagged the market.

Perhaps even more interesting than the interval problem is another problem that was first discovered in 1972 during a regulatory commission hearing considering the Communications Satellite Corporation (COMSAT). In that case, two expert witnesses calculated betas for COMSAT that would be used to establish comparable risk classes for estimating COMSAT's cost of equity. Each expert witness used the same interval (monthly) and the same total period (five years). Yet their beta estimates were not the same. The cause of the discrepancy, they discovered, was that one had used data from the third week of each month to calculate beta, whereas the other had used data from the fourth week.

A beta can be very sensitive to the interval chosen for the regres-



Stocks	
Defensive	
isk of Ten	
tematic Ri	
of the Sys	
Estimate	
The	

HORIZON (IN MONTHS)	IDAHO POWER CORP.	AMERI. CAN CAN CORP.	NATIONAL DAIRY PROD. UCTS	P. LORIL- LARD CORP.	AMERI. CAN TO. BACCO	BORDEN, INC.	ABBOTT LABORA. TORY	STAN. DARD BRANDS	GREY- HOUND
1 2 3 4 4 6 6 6 10 12 12 20 20 30	0.4282 0.4012 0.3796 0.3329 0.1881 0.3862 0.4322 0.2312 0.2367 0.1566 0.3016 0.1142 0.1068	0.5167 0.4886 0.3755 0.3311 0.2631 0.3402 0.0621 0.1236 -0.0118 0.0702 0.2049 -0.2563 -0.2690 0.0101	0.5281 0.4655 0.4475 0.3400 0.4428 0.4119 0.5309 0.4777 0.3511 0.4544 0.5016 0.3283 0.3283	0.6166 0.5711 0.3496 0.4881 0.2604 0.4253 0.4253 0.4815 -0.0656 -0.4615 -1.0612 -1.0612 -1.0387 -1.1855	0.6296 0.4652 0.4993 0.3697 0.3283 0.3706 0.3020 0.2438 0.0364 -0.0365 0.1400 -0.1060	0.6372 0.5912 0.5684 0.6142 0.3449 0.4330 0.4627 0.4272 0.3390 -0.0561 0.2336	0.6576 0.5717 0.5892 0.5284 0.6319 0.2398 0.4729 0.1243 0.1243 0.0247	0.6650 0.6147 0.5578 0.6397 0.4331 0.6112 0.7987 0.5325 0.2008 0.2008 0.7473 0.4002	0.6752 0.6651 0.5773 0.5340 0.6709 0.6709 0.4800 0.6188 0.1541 0.1719 0.2378
				1070.7	0.1187	0.1360	-0.3863	-0.0150	-0.5545

Source: D. Levhari and H. Levy, "The Capital Asset Pricing Model and the Investment Horizon," Review of Economics and Statistics, 59 (February 1977), 102.

Exhibit 4-10

Betas Estimated on the Basis of Various Return Intervals,*
January 1970–December 1973

		TRI.			
	MONTHLY	WEEKLY	BIWEEKLY RFTA	WEEKLY RFTA	DAILY
Wayne-Gossard	0.976	0.692	0.986	0.654	0.459
Michigan Seamless Tube	0.973	0.883	0.917	0.784	0.433
Publicker Industries	1.521	1.491	1.513	1.277	1.006
Great Western United	2.496	2.311	2.122	1.911	1.442
Family Finance	1.268	1.324	1.212	0.821	0.795
Bobbie Brooks	1.874	1.889	1.818	1.592	1.405
		1000		700	,,,,

0.1719 $0.2378 \\ 0.7826$ 0.48000.6188 0.1541 -0.55450.532° 0.428° 0.2008 0.7473 0.4002 0.3771 -0.0150 0.4729 0.42270.1243 0.1463 0.0247 0.2474 -0.38630.4272 0.3390 -0.0561 0.2723 0.2336 0.08490.13600.2438 0.0364 -0.0365 -0.10600.1400 0.16570.1187-0.4615 -0.0656-1.0612-1.0387-1.1855-2.0036-2.82510.5016 0.3283 0.3996 0.2781 u.4544 0.2049 0.2563 -0.26900.1236 - 0.01180.0101 0.2312 0.2367 0.1556 0.3016 0.1142 0.10680.221010 12 15 16 16 20 20 30

Source: D. Levhari and H. Levy, "The Capital Asset Pricing Model and the Investment Horizon," Review of Economics and Statistics, 59 (February 1977), 102.

Exhibit 4-10

Betas Estimated on the Basis of Various Return Intervals, January 1970-December 1973

		TRI.			
	MONTHLY	WEEKLY	BIWEEKLY	WEEKLY	DAILY
	BETA	BETA	BETA	BETA	BETA
Wayne-Gossard	0.976	0.692	0.986	0.654	0.450
Michigan Seamless Tube	0.973	0.883	0.917	0.784	25.0
Publicker Industries	1,521	1 491	1 513	1 977	0.455
Great Western United	2.496	9 311	010.1	1.277	1.006
Family Finance	8961	1 901	27.7	1.911	1.442
Dobbio Decile	1.200	1.324	1.212	0.821	0.795
Donnie Brooks	1.874	1.889	1.818	1.592	1.405
Monogram Industries	2.950	2.887	2.844	2,403	2.144
Faberge	1.882	1.511	1.511	1.416	1 449
Dillingham Corp.	1.004	1.164	0.990	0.750	0.795
Vornado	2.329	1.628	2.170	1 823	1 765
Big Three Industries	1.339	0.970	1.283	696.0	0.719
Cabot Corp.	0.752	0.898	0.844	0.805	0.756
General Development	1.423	1.628	1.657	1 389	1 950
Addresso-Multigraph	2.094	2.341	1.566	1 414	1,000
Great Western Financial	2.246	1.820	2.043	9 159	1.100
Colgate-Palmolive	1.131	1.009	1.011	0.1.0	1.917
Aluminium Co. of	1		1.011	0.938	0.850
America	1.115	1.221	1,118	1 150	1110
Shell Oil	0.930	1 009	2000	1.100	1.110
S.S. Krosono	0000	1.093	0.827	0.860	0.742
Front Wester	1.190	1.326	1.299	1.308	1.237
Eastman Nodak	0.932	0.859	0.958	1.166	1.251

*Returns are measured as the logarithm of investment relatives. Market returns are those of the S&P 500. All betas are statistically significant at the 5 percent level.

Source: Gabriel Hawawin, "Why Beta Shifts as the Return Interval Changes," Financial Analysts Journal, 39 (May-June 1983), 74.

114 Chapter 4

sion. The real difficulty is that we still must choose an estimation interval. Curiously enough, however, since we assumed all investors' horizons are identical, by choosing a particular interval we define the horizon of the market. In addition, we presume that over the horizon investors are not reallocating their portfolios; that is, they are not buying and/or selling their assets. However, the returns we are measuring are, in fact, driven by transactions that come as investors do reallocate their portfolios. Thus, we have direct evidence that all investors do not have the same horizon. How do we deal with such a conflict?

Since the CAPM gives us no guidelines for the choice of a horizon, those wishing to estimate a beta have looked elsewhere for direction. Sampling theory suggests that an adequate amount of data is needed to ensure a reasonably normal sample distribution. Since most of the hypotheses that are tested rest on the assumption of normalcy, as does the CAPM, sampling concerns (more is better) and computing constraints (less is better) have dictated the sample size. With the availability of monthly data in computer-readable form, and the need for a reasonably sized sample, the 60-observation, or five-year, estimation period became widely used. In fact it was so widely used many believed that it was the horizon. However, evidence about the importance of interval in the estimation of beta suggests that this standard may not be the best choice. We only know that we must have an adequate amount of data, without including old data that has little relevance to the current situation, and to minimize the absolute deviations.

The market proxy

In earlier CAPM history, many believed that the index choice was not a particularly important issue.⁸ Indexes were highly correlated;⁹ hence, they were assumed to be virtually interchangeable.

Since that early lack of concern about choosing an index, our theoretical and statistical knowledge has become more sophisticated. We now know that if the proxy for the market is not fully diversified (is not a good reflection of the market for all risky assets), the market model will not properly distinguish between diversifiable and nondiversifiable risk. The result would be that we could have an informationless or wrong

⁸See S. C. Myers, "The Application of Finance Theory to Public Utility Rate Cases," Bell Journal of Economics and Management Science, 3 (Spring 1972), 58-97.

*Remember that correlation is the degree of relationship between indexes. If returns moved together exactly, we would have a perfect correlation of 1.0. If they were perfectly negatively related, the correlation would be -1.0.

Estimating Beta

beta, or we could believe that non than it actually was. Correlation a alize index choice. But this methohighly correlated with each other a derlying market for all risky asset impossible, and tests using an inco important statement about the da still incomplete indexes was made

Although these problems are retical than practical. First, if all mately equivalent beta results or rour results. Furthermore, indexes and thus they at least provide sor

Therefore, the real question i affects results. The data in Exhib practical side of the index questi Jones Industrial Average (DJIA), t Value-Weighted Index in calculat estimates were quite similar; but f see that the choice of an index is practical one as well.

Stocks alone make up the inbroader index is still in the exper gave us some idea of the changes

Exhil Alphas and Betas of Ran

	GI	MI
	α	β
Cerro	-0.638	1.308
Falstaff Brewing	-1.426	1.028
Graniteville	-0.425	1.051
Scott Foresman	-0.099	1.130
Hall WF	0.202	0.695
Gulf Oil	-0.236	0.528
Fedders	2.035	1.302
AMP	1.196	0.784
Chrysler	-0.747	1.107
Zayre	2.369	1.471

Source: G. M. Frankfurter, "The Effect of Mark Portfolio Selection Model," Journal of Finance, 3

Item 14, page 17

In addition, we must avoid some known problems, such as the Fisher effect: because some stocks are not widely traded, the end-of-week or end-of-the-day price can yield an inadequate estimate of the true price, thus biasing the estimated beta.

st choose an estimation interserimed all investors' horizons we define the horizon of at the horizon investors are ney are not buying and/or sellre are measuring are, in fact, are do reallocate their portfolios. Westors do not have the same lict?

es for the choice of a horizon, oked elsewhere for direction. It is amount of data is needed to bution. Since most of the hyption of normalcy, as does the end computing constraints size. With the availability of and the need for a reasonably ear, estimation period became many believed that it was the cortance of interval in the estat may not be the best choice. Late amount of data, without to the current situation, and

t choosing an index, our theome more sophisticated. We is not fully diversified (is not by assets), the market model resifiable and nondiversifiable an informationless or wrong

ns, such as the Fisher effect: because or end-of-the-day price can yield an e estimated beta.

heory to Public Utility Rate Cases," 3 (Spring 1972), 58–97.

tionship between indexes. If returns elation of 1.0. If they were perfectly

beta, or we could believe that nonsystematic risk was larger or smaller than it actually was. Correlation analysis was used in the past to rationalize index choice. But this method is not enough: two indexes could be highly correlated with each other and still not be correlated with the underlying market for all risky assets. Thus, finding a true proxy may be impossible, and tests using an incorrect index would be useless. A more important statement about the dangers of using widely acceptable but still incomplete indexes was made by Roll (1977).

Although these problems are disturbing, they may be more theoretical than practical. First, if all our available indexes yield approximately equivalent beta results or ranks, we can have some confidence in our results. Furthermore, indexes are what investors use as benchmarks, and thus they at least provide some practical information.

Therefore, the real question is whether the choice of index actually affects results. The data in Exhibit 4-11 provide a perspective on the practical side of the index question. Frankfurter (1976) used the Dow Jones Industrial Average (DJIA), the Standard & Poor 425, and a Scholes Value-Weighted Index in calculating betas. For some stocks, the beta estimates were quite similar; but for other stocks, they were not. We can see that the choice of an index is not only a theoretical problem but a practical one as well.

Stocks alone make up the indexes used by Frankfurter. Building a broader index is still in the experimental stage, although Sharpe (1973) gave us some idea of the changes that might occur as our sophistication

Exhibit 4-11
Alphas and Betas of Randomly Selected Securities

	G	MI	S&P	425	D.	IA	
	α	β	α	β	α	β	Mean Return
Cerro	~0.638	1.308	-0.270	1.612	-0.319	1.547	0.358
Falstaff Brewing	-1.426	1.028	-1.083	1.228	-1.132	1.116	-0.644
Graniteville	-0.425	1.051	-0.031	1.133	-0.136	1.169	0.375
Scott Foresman	-0.099	1.130	0.288	1.321	0.269	1.125	0.761
Hall WF	-0.202	0.695	0.002	0.909	~0.075	0.920	0.761
Gulf Oil	-0.236	0.528	-0.163	0.920	-0.201	0.840	0.327
Fedders	2.035	1.302	2.359	1.861	2.284	1.697	3.026
AMP	1.196	0.784	1.403	1.000	1.367	0.975	1.793
Chrysler	-0.747	1.107	-0.513	1.701	-0.628	1.657	0.096
Zayre	2.369	1.471	2.867	1.738	2.768	1.649	3.489

Source: G. M. Frankfurter, "The Effect of Market Indexes on the Ex-Post Performance of the Sharpe Portfolio Selection Model," Journal of Finance, 31 (June 1976), 953.

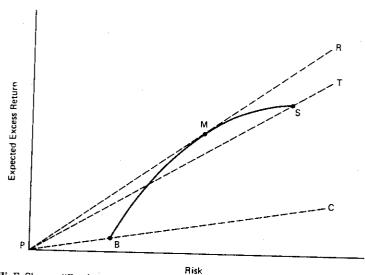
116

Chapter 4

in creating indexes increases. Exhibit 4–12 shows the hypothetical differences suggested by Sharpe. The PST line is the hypothetical capital market line using stocks alone. The PBC line could be the line using bonds, and the PMR line could be the quite different result of using a combined stock-bond index. Sharpe suggests the combined indexes would result in a higher line.

While we have reasonable proxies for the stock market, we do not have the same for bonds (or for other assets), although money management organizations are developing more extensive indexes. ¹⁰ What is obvious is that there are clear differences among the markets, and, as the 1970s and 1980s have shown, each market changes over time. ¹¹ Still data from the stock market, although limited in the assets they contain, are an available and widely used accommodation.

Exhibit 4-12 Opportunity Sets Using Different Indexes



Source: W. F. Sharpe, "Bonds vs. Stocks: Some Lessons from Capital Market Theory," Financial Analysts Journal, 29 (November-December 1973), 75.

¹⁰See, for instance, First Chicago Bank's First Chicago Investment Advisors' Multiple Markets Index, which includes large and small capitalization, and international equities, venture capital, domestic and international dollar and nondollar bonds, real estate, and cash equivalents.

¹¹The relative volatility of the bond markets since the mid-1970s has been markedly higher than the volatility previously experienced.

Estimating Beta

The market model form

There is little in the acader ferent forms of the market model model changes, all else staying the not.

There are a variety of versic ple market model:

$$R_i = \alpha$$

We have the risk-premium versio bills to AA utility bonds for R_{ℓ}

$$R_j - R_f = \alpha_j$$

There is a less compact form of

$$R_{i} = \alpha_{i} + \beta$$

If all of these market model for the same and the intercept term α_j of the simple model would be premium model and equal to th risk-premium model.¹²

Exhibit 4-13 shows the res

Exi

The Results of Three \
for a Public U

	α
Simple model	-0.0027
Risk-premium model‡	-0.0041
Multifactor‡	-0.0043

*Coefficient for R_f in the multifacto †Coefficient for market volatility fa ‡ R_f proxy is the return on Treasury Source: D. Harrington, "The Capital Asset Pr dissertation, 1978), 164.

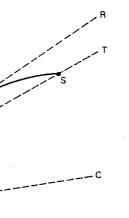
¹²These models exist in both comp cause market returns are normally reporgeometric form.

Item 14, page 19

2 shows the hypothetical difne is the hypothetical capital could be the line using different result of using a ts the combined indexes would

the stock market, we do not ets), although money managetensive indexes.10 What is obong the markets, and, as the changes over time.11 Still data n the assets they contain, are

ferent Indexes



n Capital Market Theory," Financial An-

Chicago Investment Advisors' Mulcapitalization, and international eqlar and nondollar bonds, real estate,

ice the mid-1970s has been markedly

The market model form

Estimating Beta

There is little in the academic literature about the impact that different forms of the market model have on beta. If the form of the market model changes, all else staying the same, will the beta change? It should

There are a variety of versions of the market model. We have a simple market model:

$$R_j = \alpha_j + \beta_j R_m + \epsilon_j$$

We have the risk-premium version, where we could use anything from Tbills to AA utility bonds for R_f .

$$R_j - R_f = \alpha_j + \beta_j (R_m - R_f) + \epsilon_j$$

There is a less compact form of the risk-premium version:

$$R_j = \alpha_j + \beta_{j1}(R_j) + \beta_{j2}R_m + \epsilon_j$$

If all of these market model forms are equivalent, the betas should be the same and the intercept terms should be equal. This means that the α_{j} of the simple model would be equal to the term α_{j} , $+ R_{f}$ of the riskpremium model and equal to the term $\alpha_j + \beta_{j1}(R_j)$ of the less compact risk-premium model.12

Exhibit 4-13 shows the results of using the different models in cal-

Exhibit 4-13 The Results of Three Versions of the Market Model for a Public Utility (Monthly Data)

	α	β_1 *	β_2 †	R²
Simple model	-0.0027		0.544	.467
Risk-premium model‡	-0.0041		0.615	.378
Multifactor‡	-0.0043	0.17	0.612	.497

Coefficient for R_f in the multifactor model.

Source: D. Harrington, "The Capital Asset Pricing Model and Regulated Utility Cost of Equity" (Ph.D. dissertation, 1978), 164.

[†]Coefficient for market volatility factor.

 $[\]ddagger R_i$ proxy is the return on Treasury bills.

¹² These models exist in both compound (geometric) form and arithmetic form. Because market returns are normally reported as compound rates of return, many prefer the geometric form.

culating betas for one utility. And neither the betas nor the intercepts are equal from model to model. These forms are all variations of the basic CAPM. None have been modified to deal directly with the problems of misspecification.

We have considered the results of changing some of the simple parameters that are necessary for estimating a beta using historical data. The choice of each input changes the output, and the size of the difference is enough to cause concern. How should betas be measured, using history? The disconcerting answer is that we do not know. Finding the best way to measure beta is not merely a theoretical problem; it is a practical one. The search still requires trial-and-error experimentation.

II. TESTING THE STABILITY OF HISTORICAL BETAS

Now that we have outlined some of the problems involved in measuring historical betas, let us return to the more fundamental issue of the usefulness of history in predicting the future. If historical betas are reasonable predictors of future betas, then we should definitely spend the time required to refine our statistical tools. If historical betas are not reasonable predictors, then we must look for a better way to make beta forecasts. Because the use of historical data to predict the future assumes that betas are stable over time, most tests of the usefulness of historical betas have focused on the issue of the stability of historical betas. If historical betas remain relatively unchanged over time, then historical betas may be useful surrogates for forecasted (ex ante) betas. If, however, historical betas vary over time, then they will have little predictive ability.

What are the results of tests of the stability of historical betas?

1. ANALYSIS OF INDIVIDUAL SECURITIES' BETAS

Bey (1983) used a sophisticated statistical approach to look at the stability of the betas of public utility and industrial stocks. Exhibit 4-14 shows some of his results for individual (not portfolios) utility stocks. For different industries, Exhibit 4-15 shows mean betas and the proportion that were stationary. Note that the ordinary-least-squares (OLS) betas change quite dramatically from period to period—they were not stable.

The average beta is an imprecise estimate. Blume (1971) reported that although the market's average beta was 1.0 (as we would expect), the average standard error (0.30) resulted in a 95 percent confidence in-

E Beta and Mar

UTILITY NAME	1/60-12/0
Consolidated Edison Co.	
N.Y. Inc.	0.59*
Consolidated Natural	
Gas. Co.	0.59
Consumers Power Co.	0.69
Dayton Power	
& Light Co.	0.76
Delmarva Power	
& Light Co.	0.85
Detroit Edison Co.	0.64
Duquesne Light Co.	0.52
El Paso Co.	0.69
Empire District	
Electric Co.	0.67
Enserch Corp.	0.47

*Nonstationary beta for $\alpha=0.05$ Source: Roger P. Bey, "Market Model Stati and Quantitative Analysis, 18 (March 1983)."

terval from 0.4 to 1.6. (That is erage historical beta was between a beta estimate made with con his finding that, over time, beta of 1.0. We are not now sure w changes in the riskiness of the the phenomenon is clear. Exhi documented. From the first to one exception—becomes closer

As a result of this finding, producers began to adjust their to improve their forecasts. Ho (1979) believed that this beta d onstrated that betas drift sim they are calculated moving for 4-17 shows their results. Fron their OLS and their Bayesian-a drift appears to be a statistica help analysts to determine the to adjust forecasts.

Itam 14, page 21

r the betas nor the intercepts as are all variations of the basic tly with the problems of

anging some of the simple page a beta using historical data. put, and the size of the differould betas be measured, using twe do not know. Finding the a theoretical problem; it is a al-and-error experimentation.

TABILITY BETAS

fundamental issue of the useIf historical betas are reasonould definitely spend the time
historical betas are not reasonbetter way to make beta foreto predict the future assumes
of the usefulness of historical
tability of historical betas. If
ged over time, then historical
actived (ex ante) betas. If, howwill have little predictive

stability of historical betas?

s

I approach to look at the standustrial stocks. Exhibit 4-14 at portfolios) utility stocks. For nean betas and the proportion ary-least-squares (OLS) betas period—they were not stable. timate. Blume (1971) reported was 1.0 (as we would expect), in a 95 percent confidence in-

Exhibit 4-14

Beta and Market Model Stationarity

		ESTIMATED	OLS BETAS	
UTILITY NAME	1/60-12/64	1/65-12/69	1/70-12/74	1/75-12/79
Consolidated Edison Co.			, , , , , , , , , , , , , , , , , , , ,	
N.Y. Inc.	0.59*	0.46*	0.55*	1.12*
Consolidated Natural		*****	0.00	1.12
Gas. Co.	0.59	0.61	0.39*	0.89
Consumers Power Co.	0.69	0.67	0.59*	1.04*
Dayton Power				
& Light Co.	0.76	0.99	0.39	0.78*
Delmarva Power			****	0.70
& Light Co.	0.85	0.82	0.72*	0.75*
Detroit Edison Co.	0.64	0.50	0.55*	0.98*
Duquesne Light Co.	0.52	0.27	0.46	0.84*
El Paso Co.	0.69	0.54*	0.84*	1.00
Empire District			0.01	1.00
Electric Co.	0.67	0.58	0.25*	0.57
Enserch Corp.	0.47	0.94*	1.02*	0.62

*Nonstationary beta for $\alpha = 0.05$.

Source: Roger P. Bey, "Market Model Stationarity of Individual Public Utilities," Journal of Finance and Quantitative Analysis, 18 (March 1983), 74.

terval from 0.4 to 1.6. (That is, one can be 95 percent sure that the average historical beta was between 0.4 and 1.6.) This could not be called a beta estimate made with confidence. Blume must also be credited for his finding that, over time, betas tend to drift toward the market average of 1.0. We are not now sure whether this movement is caused by true changes in the riskiness of the securities or by statistical problems, but the phenomenon is clear. Exhibit 4-16 shows the problem that Blume documented. From the first to the second period, each beta—with only one exception—becomes closer to 1.0.

As a result of this finding, called beta drift, several commercial beta producers began to adjust their forecasted betas toward 1.0 in an effort to improve their forecasts. However, Elgers, Haltiner, and Hawthorne (1979) believed that this beta drift was a statistical aberration and demonstrated that betas drift similarly toward 1.0, regardless of whether they are calculated moving forward or backward through time. Exhibit 4–17 shows their results. From periods 1 to 2 and from periods 2 to 1 their OLS and their Bayesian-adjusted betas drift toward 1.0. Thus, the drift appears to be a statistical aberration. It cannot be relied upon to help analysts to determine the stability of calculated historical betas or to adjust forecasts.

Mean eta and Percentage of Securities with Market Model Nonstationarity Exhibit 4-15

	NO. OF		MEAN BET	MEAN BETA ESTIMATE	111	PER	CENTAGE (NONSTAT	PERCENTAGE OF SECURI NONSTATIONARY	TIES
SIC	SECURI- TIES	1/60-12/64	1/65- 12/69	$\frac{1/70}{12/74}$	1/75-	1/60-	1/65-	1/70-	1/75-
10	11	0.57	0.78	000	100			11/21	14/13
20	32	700		0.00	0.97	18	18	36	36
22	! 5	50.0	1.04	0.93	1.00	34	13	28	47
26	2 -	0.50	1.41	1.06	1.37	50	0	30	. 02
α 1 %	# CF	1.10	1.15	1.03	1.19	29	21	98	. u
5 6	7 1 01	1.22	1.17	1.07	1.06	29	19	36	38
6	0 5	0.82	0.89	0.99	0.80	44	4	36	9 6
33	71	1.16	1.26	1.08	1.20	50	33) (X	6 2
33	10	1.08	1.47	1.07	1.34	38	44	95 55	0 4
37	77	1.17	1.27	1.05	1.21	30	22	61	5 4
, K	T .	1.03	1.24	0.97	1.29	36	. .	2 7	† † ¢
96	- d	1.17	1.28	1.16	1.32	24	33	7 7	? ?
0 !	29	1.36	1.30	1.24	1.35	36	3 5	Į (94
37	34	1.04	1.45	11.	9 -	90	n n	48	48
38	10	1.34	1 30	1.11	20.1	42	24	38	41
40	10	1.16	1.00	1.99	1.42	40	20	10	20
45	10	1.61	1.0.	1.09	1.03	40	20	30	30
49	6	1.01	1.12	1.80	1.62	40	30	10) (F
53	<u> </u>	11.0	0.03	0.65	0.78	21	17	41	62
67	2.6	0.00	1.09	1.14	1.21	23	œ	31	69
E	S (0.33	1.18	0.99	1.09	24	33	38	57
100	453	į				30	22	34	40

Source: Roger P. Bey, "Market Model Stationarity of Individual Public Utilities," Journal of Finance and Quantitative Analysis, 18 (March 1983), 76.

 $\alpha = 0.05$.

Exhibit 4-16

Estimated Beta Coefficients for Portfolios of 100 Securities in Two Successive Periods

•		^	-	11	20	000	3	,	3	69	70	08	3	7.7	5	•	49
7.	87	2	30	3	10	0.6	2	10	2	41	+	.5	;	86	3	6	34
1	10	21	24	; ;	2	06	2	30)	7.7	•	οc)	67	,	90	77
,	38)	24		₽	40	2	40	1	21	1 1	23		24		30	2
	1.35		1.52	97.1	1.42	1.03)	1.62	+	0.78		1.21		1.09			
	1.24	,	1.11	1 90	1.00	1.09		1.80		0.65	,	1.14	0	0.99			
	1.30		1.45	1 90	1.00	1.07		1.72	000	0.63		F.03	,	1.18			i
,	1.3(ć	₹.04	1.9.4		1.16	· ·	1.61		0.71	900	0.00	000	0.93			
0	53	,	*	9	3	10	0.	n n	00	D. 0	10	77	6	177		453	
	ð	7.0	5	œ.) (40	76	40	40	2	5.0	2	67	5		Total	

 $\alpha = 0.05$.

Source: Roger P. Bey, "Market Model Stationarity of Individual Public Utilities," Journal of Finance and Quantitative Analysis, 18 (March 1983), 76.

Exhibit 4-16

Estimated Beta Coefficients for Portfolios of 100 Securities in Two Successive Periods

	7/61- 6/68	0.620	0.707	0.861	0.914	0.995	1.169
	7/54-6/61	0.393	0.612	0.810	0.987	1.138	1,337
	7/54-6/61	0.553	0.748	0.971	1.010	1.095	1.243
0	7/47- 6/54	0.385	0.654	0.832	0.967	1.093	1.245
	7/47- 6/54	0.593	0.776	0.887	1.008	1.124	1.251
	7/40- 6/47	0.442	0.615	0.746	0.876	1.037	1.282
2	7/40- 6/47	0.573	0.784	0.902	1.145	1.354	
	7/33- 6/40	0.394	0.708	0.925	1.177	1.403	
	7/33- 6/40	0.610	1.004	1.296	•		
	7/26- 6/33	0.528	0.898	1.225			
	PORT. FOLIO	-	7	ന	4	rc.	9
•	'						,

Source: M. Blume, "On the Assessment of Risk," Journal of Finance, 26 (March 1971), 7.

Exhibit 4-17

	PERIOD 1 (7/54-6/61)	OLS	0.559	0.000	0.709	0.00	0.921	1.143	1.315	,
riods	PERIOD 2 7/61-6/68)	OLS Adjusted	0.515	0.010	0.000	0.102	0.684	1111	1.408	
ime Pe	PER (7/6	OLS	0.393	0.566	0.000	0 855	0.000	1.139	1.510	
ccessive T	PORT. FOLIO	BER	 	6	ı cr) 4	ıc	9		
Portfolio Betas in Successive Time Periods	PERIOD 2 (7/61-6/68)	OLS	0.592	0.634	0.780	0.872	0.940	1.061	1.286	
Portfoli	PERIOD 1 (7/54-6/61)	Adjusted	0.522	0.676	0.825	0.962	1.072	1.194	1.480	
	PEF (7/5	OLS ,	0.381	0.581	0.774	0.950	1.093	1.252	1.621	
i	PORT- FOLIO NUM-	BER	-	2	က	4	S.	9	7	

ce: P. T. Elgers, J. R. Haltiner, and W. H. Hawthorne, "Beta Regression Tendencies: Statistical and Real Causes," and of Finance, 34 (March 1979), 262.

Estimating Beta

In another early study of bet that if the amount of variance ex period to the next, then betas we to another. Exhibit 4-18 shows a beta, as we would expect, was que occurred in both periods, showin each other. For many individual returns' behavior explained by t from period to period. For instanccall instability.

In reviewing such results, of ers's contention, let us graphical Oil Company stock, which is one the left in Exhibit 4-19 are grap percent of the changes in return in market returns. The remainds came from unsystematic sources firm or industry. Perhaps Shell h

Ex

Percentage of Variance (R²) Ex (Market Factor) fr

COMPANY NAME

Allegheny Power System Allied Chemical American Motors American Tobacco Co. Atchison, Topeka and Santa Fe Chesapeake and Ohio Coca-Cola Consolidated Edison of NY Detroit Edison General Electric IBM ITT Maytag Pacific Gas and Electric Shell Oil Southern California Edison Average of 94 companies

Source: Adapted from S. C. Meyers, "The Security Price Behavior," Accounting Revie

In another early study of beta stability, Meyers (1973) hypothesized that if the amount of variance explained by the market varied from one period to the next, then betas would not be stationary from one period to another. Exhibit 4-18 shows some of Meyers's results. The portfolio beta, as we would expect, was quite stable. Virtually the same variance occurred in both periods, showing that beta estimation errors canceled each other. For many individual securities, however, the amount of the returns' behavior explained by the market (the R^2) was quite different from period to period. For instance, Coca-Cola showed what Meyers would call instability.

In reviewing such results, one must use logic. To demonstrate Meyers's contention, let us graphically represent the variances for the Shell Oil Company stock, which is one of the stocks listed in Exhibit 4-18. To the left in Exhibit 4-19 are graphed the results for the first period: 34.6 percent of the changes in returns from this stock reflected the changes in market returns. The remainder of the changes in the stock's returns came from unsystematic sources—from factors specifically related to the firm or industry. Perhaps Shell had unexpected good fortune in securing

Exhibit 4–18

Percentage of Variance (R^2) Explained by First Principal Component (Market Factor) from Stock Price Relatives

COMPANY NAME	AUGUST 1952- AUGUST 1960	JANUARY 1961- DECEMBER 1967
Allegheny Power System	46.2	14.1
Allied Chemical	43.8	44.9
American Motors	5.2	15.3
American Tobacco Co.	11.0	40.7
Atchison, Topeka and Santa Fe	60.0	40.4
Chesapeake and Ohio	50.0	53.3
Coca-Cola	11.1	29.2
Consolidated Edison of NY	11.1	8.5
Detroit Edison	14.3	. 15.4
General Electric	34.3	27.6
IBM	25.8	45.9
ITT	37.8	46.2
Maytag	25.0	26.0
Pacific Gas and Electric	30.0	26.4
Shell Oil	34.6	6.3
Southern California Edison	17.9	22.9
Average of 94 companies	33.4	33.5

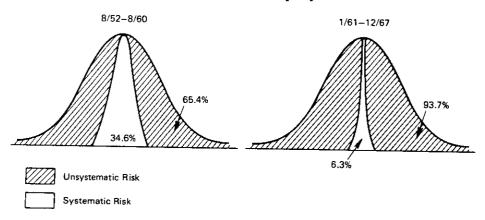
Source: Adapted from S. C. Meyers, "The Stationarity Problem in the Use of the Market Model of Security Price Behavior," Accounting Review, 48 (April 1973), 320.

I Em 14, page 21

1.093 0.940 5 0.974 0.980 1.149 1.177 1.621 1.480 1.286 7 1.510 1.408 1.315 P.T. Elgers, J. R. Haltiner, and W. H., Hawthorne. "Beta Repression Tendencies Statistical and Real Causes

Exhibit 4-19

Percentage of Total Risk from Systematic and Unsystematic Sources for Shell Oil Company



a new source of oil or reducing delivery costs. In the second period (graphed to the right), 6.3 percent of the changes were related to systematic factors. Does this result mean that the beta changed? There is no way to tell from these data. We can say that the returns from one company's stock were more influenced by marketwide forces in one period than in another, but we can say nothing about the beta.

Meyer's results showed that the portfolio beta was relatively stable. Blume (1971, 1975) and Porter and Ezzell (1975) also looked at the stability of portfolios. Using two different methods for forming portfolios, they had what appeared to be conflicting results: increasing the size of the portfolio may or may not increase the stability of beta. After correcting for the different ways in which Blume and Porter and Ezzell created their portfolios, Alexander and Chervany (1980) found that their results were not in conflict—beta was more stable in more diversified portfolios. In addition, they found that most of the improvement in beta stability occurred by the point where there were ten securities in the portfolio. Added securities lent small improvements.

Thus, it appears that portfolio betas are relatively stable, and, by inference, easier to predict than the betas for individual stocks.

2. ANALYZING RISK CLASSES

Another way of assessing beta stability is to look at beta rankings. The hypothesis is that if the firm stays in the same beta class from period

to period, betas could be said to be predictors. Blume (1971) used two to test for stability. Looking at the see the results of his test for the 168. Portfolios with only one secupercent of the time. This means risk class. This is a stronger result found betas for individual securities more apt to remain in the same rities had very accurate risk rand changed rank between the two per Blume found virtually no shares that of the market (there were a

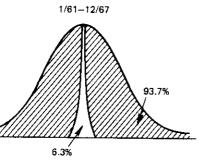
Baesel (1974), using anothe further tested the stability of r into five risk classes and then whether the securities remained shows his transition matrix, inc classes from one period to the ne the frequency with which securi periods. For instance, 12 percer remained in class 1 for the next those in class 1 in the first per following period. Baesel himse enough to say that betas for sin is all. Admittedly, Baesel's group Because classes 1 and 5 include classes, the range is broad. The classes is more reliable. Confirm vany found, in a closer examina extreme groups, that "larger cha pentiles than in the interior pen

In both Blume's and Baes portfolios were more stable th Others have confirmed these re

13Gordon J. Alexander, and N. I Beta," Journal of Financial and Quanti 14R. C. Klemkosky and J. D. Mar of Finance, 30 (September 1975), 1123beta levels in testing various-sized por creased as the portfolio size increased." captured or explained more of the histo "A Note on the Predictive Ability of E (October 1975), 365-71, also studied th

Itam 14, page 27

d Unsystematic Sources



costs. In the second period langes were related to systemhe beta changed? There is no not the returns from one comrketwide forces in one period bout the beta.

olio beta was relatively stable. (1975) also looked at the stachinds for forming portfolios,

ts: increasing the size of a stability of beta. After corme and Porter and Ezzell crevany (1980) found that their are stable in more diversified at of the improvement in beta re were ten securities in the overments.

are relatively stable, and, by for individual stocks.

to look at beta rankings. The same beta class from period

to period, betas could be said to be relatively stable and thus reasonable predictors. Blume (1971) used two similar methods of ranking the betas to test for stability. Looking at the last column in Exhibit 4-20, we can see the results of his test for the period 1954-61 versus the period 1961-68. Portfolios with only one security remained in the same risk class 62 percent of the time. This means that 38 percent of the stocks changed risk class. This is a stronger result than those obtained from studies that found betas for individual securities were unstable. Larger portfolios were more apt to remain in the same risk class and portfolios with 50 securities had very accurate risk rankings; only 3 percent of these portfolios changed rank between the two periods. Of further interest is the fact that Blume found virtually no shares that moved in a direction opposite to that of the market (there were almost no negative correlations).

Baesel (1974), using another technique called a transition matrix, further tested the stability of risk classes. Baesel classified securities into five risk classes and then tested them in the next period to see whether the securities remained in the same risk class. Exhibit 4-21 shows his transition matrix, indicating the stability of securities' risk classes from one period to the next. Each number in the table represents the frequency with which securities fell into a single risk group in both periods. For instance, 12 percent of the securities in class 1, period t, remained in class 1 for the next period (t + 1). Conversely, 88 percent of those in class 1 in the first period changed to a different class in the following period. Baesel himself characterized his results as strong enough to say that betas for single securities were not random, but that is all. Admittedly, Baesel's grouping technique does have some problems. Because classes 1 and 5 include all those falling outside the three central classes, the range is broad. The information regarding the three central classes is more reliable. Confirming this suspicion, Alexander and Chervany found, in a closer examination of the behavior of the betas in the extreme groups, that "larger changes in the beta occurred in the extreme pentiles than in the interior pentiles for all but one case."13

In both Blume's and Baesel's tests, betas for randomly generated portfolios were more stable than were betas for individual securities. Others have confirmed these results.¹⁴

¹³Gordon J. Alexander, and N. L. Chervany, "On the Estimation and Stability of Beta," *Journal of Financial and Quantitative Analysis*, 15 (March 1980), 125.

¹⁴R. C. Klemkosky and J. D. Martin, "The Adjustment of Beta Forecasts," Journal of Finance, 30 (September 1975), 1123–28, used standard errors for the betas rather than beta levels in testing various-sized portfolios. They showed that the standard errors decreased as the portfolio size increased. This result indicates that betas for larger portfolios captured or explained more of the historical variation. R. Burr Porter and J. R. Ezzell, in "A Note on the Predictive Ability of Beta Coefficients," Journal of Business Research, 3 (October 1975), 365–71, also studied the question.

Exhibit 4-20

	LIONACLI	Moment at	nd Kank-C	order Corr	uct Moment and Kank-Order Correlation of Betas for Portfoliog of N. C.	Betas for 1	Portfolios	of M C	• • •	
	76/1	(6/3)					en incirc	OI IN SECTION	rines	
NUMBER OF	7/r	and	7/33	/33-6/40 and	7/40	//40-6/47	7/47	7/47-6/54	7/54	/54-6/61
SECURITIES PER PORT.	7/33	//33-6/40	7/40	7/40-6/47	a: 7/47-	and /476/54	a 7/54	and /54-6/61	al 7/61	and //61 6/20
FOLIO	P.M.	Rank	P.	Rank	Ma	-			10/,	00/0
	650			WIIIIW	r.M.	Kank	P.M.	Rank	P.M.	Rank
. 6	0.00	0.69	0.62	0.73	0.59	0.65	0 88	100		
3 ₹	0.71	0.75	0.76	0.83	0.72	0.79	0.00	0.07	0.60	0.62
* t	0.80	0.84	0.85	0.00	0.81	08.0	0.0	0.76	0.73	0.74
- ;	98.0	0.00	0.91	0.93	10:0	60.0	0.84	0.84	0.84	0.85
10	0.89	0.93	0.94	0.95	00.00	0.00 0.00	0.87	0.88	0.88	0.89
8 i	0.93	0.99	0.97	0.98	0.90	0.95	0.92	0.93	0.92	0.93
දි ද	96.0	1.00	0.98	0.99	0.30	0.98	0.95	96.0	0.97	0.98
90	0.98	1.00	0.99	86 0	00.0	0.99	0.97	0.98	0.97	0.97
Commerce M Di				200	0.30	0.99	96.0	0.98	0.98	0 07

0.97

M. Blume, "On the Assessment of Risk." Journal of Finance, 26 (March 1971), 7.

Source:

Estimating Beta

Twelve-Month Estimatic

Exh:

		R
RISK CLASS PERIOD t	1	2
1	.12	.1
2	.15	.2
3	.18	.1
4	.22	.2
5	.33	.2

Source: J. Baesel, "On the Assessment of Risk (December 1974), 1492.

3. ANALYZING STANDARD ERRORS

Klemkosky and Martin (1975) ex to decrease as the number of secu increased. They broke the meaninefficiency, and randomness. Bia mates or underestimates the acti prediction has positive errors for betas. Random errors are the un-

In Exhibit 4-22 we see that random portfolios for July 1962showed little bias but significar tended to be correlated with the l forecast the actual result, where underforecasts. Random errors d because random errors could off:

Klemkosky and Martin tes that practitioners were using to r to inefficiency. Exhibit 4-23 sho ment, tested by Klemkosky and for the security with the average firm issuing the security in ques

¹⁵This same mean-squared error t the length of the estimation period on t found that the longer the period and the error. The improvement was largely due and J. K. Zumwalt, "Impact of Alternativ Stability of Security and Portfolio Bet 1981), 321-25.

Journal of

Exhibit 4-21
Twelve-Month Estimation Interval Transition Matrix

RISK CLASS		RISK C	LASS PERIO	D t + 1	
PERIOD t	1	2	3	4	5
1	.12	.16	.17	.21	.34
2	.15	.21	.22	.21	.23
3	.18	.18	.23	.21	.13
4	.22	.23	.19	.21	.12
5	.33	.22	.19	.14	.12

Source: J. Baesel, "On the Assessment of Risk: Some Further Considerations," Journal of Finance, 29 (December 1974), 1492.

3. ANALYZING STANDARD ERRORS

Klemkosky and Martin (1975) examined what caused the size of errors to decrease as the number of securities in randomly generated portfolios increased. They broke the mean-squared error into three portions: bias, inefficiency, and randomness. Bias indicates that a prediction overestimates or underestimates the actual result. Inefficiency indicates that a prediction has positive errors for low betas and negative errors for high betas. Random errors are the unexplainable errors.

In Exhibit 4-22 we see that the betas of Klemkosky and Martin's random portfolios for July 1962-June 1967 versus July 1967-June 1972 showed little bias but significant inefficiency. Most prediction errors tended to be correlated with the beta: for low-beta stocks, the betas overforecast the actual result, whereas for high-beta stocks, the betas were underforecasts. Random errors decreased as the portfolio size increased, because random errors could offset one another in larger portfolios.¹⁵

Klemkosky and Martin tested a variety of adjustment techniques that practitioners were using to reduce the portion of the error ascribable to inefficiency. Exhibit 4-23 shows their results. The Bayesian adjustment, tested by Klemkosky and Martin, combined the beta estimated for the security with the average beta for a group of firms similar to the firm issuing the security in question. For instance, if we were predicting

¹⁸This same mean-squared error technique has been used to measure the effect of the length of the estimation period on the quality of the forecast. Eubank and Zumwalt found that the longer the period and the larger the portfolio, the smaller the mean-squared error. The improvement was largely due to increased efficiency. See Arthur A. Eubank, Jr., and J. K. Zumwalt, "Impact of Alternative Length Estimation and Prediction Periods on the Stability of Security and Portfolio Betas," *Journal of Business Research*, 9 (September 1981), 321–25.

Exhibit 4-22

Source of the Mean-Squared Errors in Beta Predictions,
July 1962-June 1967 vs. July 1967-June 1972

	PORT	FOLIO SIZI	(NUMBER	OF SECU	RITIES)
	1	3	5	7	10
MSE Portions of MSE due to:	16122	.08363	.06880	.05982	.05465
Bias Inefficiency Random errors	.00093 .03992 .12036	.00100 .03947 .04314	.00093 .03993 .02792	.00097 .03975 .01908	.00119 .03800 .01545

Source: Adapted from R. C. Klemkosky and J. D. Martin, "The Adjustment of Beta Forecasts," Journal of Finance, 30 (September 1975), 1125.

an electric utility's beta, our choice might be the average beta for all utilities or that for Moody's 24 Electrics. The Blume adjustment combines the current beta estimate with the prior-period betas. The "MLPFS" is the Merrill Lynch technique of weighting the calculated beta with the market beta of one.

As we can see, Blume's technique reduces inefficiency, and the Bayesian adjustment reduces bias. On the whole, however, the total error is largely caused by random errors, and little besides increasing the portfolio size can be done about that. The law of large numbers is of slight comfort to those evaluating individual securities.

An active portfolio manager might like to know how many securities it takes to control ex ante portfolio betas, to, say, ± 2 percent of their weighted average. The surprising answer is that it takes more securities to control beta mismeasurement than to control unsystematic risk in terms of their impact on portfolios. The number is about 800-a number large enough to seriously dilute any benefits from active management.

Randomly composed portfolios reduce beta instability. Is this statement also true for structured portfolios? Beta reliability and stability, of course, improve, but not as much as they improve by randomly composed portfolios. The practical problems of beta instability, in short, remain serious for the practicing manager with active management objectives for his or her portfolio.

Beta is unstable, as much of the evidence clearly shows. In fact, a number of researchers, using quite different methods for estimating beta, have found that much of the regression error (the residual risk), and the relationship between the residual risk and beta, may come from misestimating a nonstationary beta.

Exhibit 4–23
Forecast Errors of Adjusted Versus Unadjusted Beta Coefficients

	ZI	NDIVIDUAL SECURITIES	CURITIES		PC	ORTFOLIOS (SIZE TEN)	SIZE TEN)	
	Unadjusted	Bayesian	Blume's	MLPFS	Unadjusted	Bayesian	Blume's	MLPFS
Period 2								
Mean Square Error (MSE)	.18387	.13111	.11123	.11015	.08544	.03460	.01259	.01153
Portion of MSE due to:								
Bias	.00084	.00004	.00183	.00075	.00095	90000	.00178	.00072
Inefficiency	.07367	.02372	.00004	.00004	.07370	.02355	.00002	.00002
			:		01010	01100	01078	01078

·22 r in Boto f

in Beta Predictions, 967–June 1972

ZE (NOMBER	OF SECUR	RITIES)
5	7	10
.06880	.05982	.05465
.00093	.00097	.00119
.03993	.03975	.03800
.02792	.01908	.01545

n, "The Adjustment of Beta Forecasts," Jour-

ght be the average beta for all s. The Blume adjustment comthe prior-period betas. The ue of weighting the calculated

e reduces inefficiency, and the e whole, however, the total error ttle besides increasing the portw of large numbers is of slight ecurities.

like to know how many securitas, to, say, ±2 percent of their at it takes more securities

o untrol unsystematic risk in umber is about 800—a number fits from active management. See beta instability. Is this stated are reliability and stability, of ey improve by randomly composed beta instability, in short, rewith active management objectives.

dence clearly shows. In fact, a at methods for estimating beta, rror (the residual risk), and the d beta, may come from mises-

Exhibit 4-23

Forecast Errors of Adjusted Versus Unadjusted Beta Coefficients

	2	INDIVIDUAL SECURITIES	CURITIES		PC	PORTFOLIOS (SIZE TEN)	SIZE TEN)	
	Unadjusted	Bayesian	Blume's	MLPFS	Unadinstod	Ranocian	Plume's	MIDE
Period 2					natenina	Daycolali	Diumes	MLFFS
Mean Square Error (MSE) Portion of MSE due to:	.18387	.13111	.11123	.11015	.08544	.03460	.01259	.01153
Bias Inefficiency Random error	.00084 .07367 .10935	.00004 .02372 .10735	.00183 .00004 .10936	.00075 .00004 .10936	.00095 .07370 .01078	.00006 .02355 .01100	.00002	.00072 .00002
Fenoa 3 Mean Square Error (MSE) Portion of MSE due to:	.12385	.11609	.12207	.12293	.02332	.01356	.02155	.02238
Bias Inefficiency Random error Period 4	.00018 .00730 .11636	.00011 .00043 .11555	.00000 .00571 .11636	.00087 .00571 .11636	.00018 .00725 .01587	.00011 .00047 .01298	.00000 .00567 .01587	.00083 .00567 .01587
Mean Square Error (MSE) Portion of MSE due to:	.16122	.13082	.14660	.14934	.05465	.02018	.04215	.04485
Bias Inefficiency Random error	.00093 .03992 .12036	.00000 .00981 .12101	.00263 .02361 .12036	.00537 .02361 .12036	.00119	.00000.	.00252	.00522

Source: R. C. Klemkosky and J. D. Martin, "The Adjustment of Beta Forecasts," Journal of Finance, 30 (September 1975), 1127

Chapter 4

Typically we have estimated beta from history, using a fixed-coefficient model like ordinary-least-squares regression. These models estimate one beta over time. Using a time-varying model, one where the beta is allowed to vary over time, Chen (1981) found that "the use of the OLS method (or fixed-coefficient model) will overestimate the portfolio residual risk if individual security beta coefficients are changing over time." Once Chen removed the beta variability from the residual risk, the residual risks were stationary and the relationship between residual risk and beta was eliminated.¹⁷

The time-varying models do appear to eliminate some of the problems that unstable betas create. As for creating a beta coefficient that can be used to estimate future returns, however, these models have their limitations.

Kryzanowski and To (1984) believe that much of the cause of beta instability is not real instability at all. They suggest that estimates of betas using time-series analysis of historic data rely on the past returns, whereas beta is a function of the expected return. Thus, they say that "betas estimated using ex-post return data can be expected to exhibit intertemporal non-stationarity, even when the underlying ex-ante security returns are serially independent and obey a stationary distribution over time." 18

4. STABILITY OF CORRELATION COEFFICIENTS

130

A correlation coefficient (R) is an ingredient needed to estimate a beta. If the correlation coefficient is unpredictable, then researchers believe that it would be difficult to say that the beta is stable or predictable. Elton, Gruber, and Urich (1978) looked at six methods of estimating the correlation coefficients. They did not break their results down into error components, as Klemkosky and Martin did, but they did test some interesting methods of predicting correlations. The methods tested, which were different from those in the Klemkosky-Martin study, were the following:

1. The overall mean, a simple average correlation coefficient for the stocks included in the test

¹⁶Son-Nan Chen, "Beta Nonstationarity, Portfolio Residual Risk and Diversification," Journal of Financial and Quantitative Analysis, 16 (March 1981), 95-112.

¹⁸Lawrence Kryzanowski and Minh Chau To, "The Telescopic Effect of Past Return Realizations on Ex-Post Beta Estimates," Financial Review, 19 (March 1984), 1.

Estimating Beta

- 2. A perfect correlation of
- 3. The Vasicek method, sir viously
- 4. The full historical metho years of data for the par

Their results, shown in Exhi riods studied, the overall mean v correlations—better than the mc mean is a very cynical method of that the best forecast is just an avefforts to refine the estimate for

In a more recent study of a services, Harrington (1981) found measure of forecast skill. Althou, some did perform better than oth results for a sample of utility storesults are those for a forecast hor of periods and samples were testerrors is similar. The study also CAPM framework to forecast redifficult to forecast.

Thus, we find that betas for larly stable, nor do most securit one period to another. Analysis though some components of error standard error can be lessened on folio. Finally, we find that the b

Exi Average Absolute Error* for

FIRST FIVE YE	ARS	SECON
1. Overall Mean	.1169	1. Overall
2. Blume Beta	.1270	2. Blume l
3. Vasicek Beta	.1289	(3. Unadju
4. Unadjusted Beta	.1348	4. Full His
5. Beta = 1	.1378	5. Vasicek
6. Full Historical	.1436	6. Beta =

*All differences are statistically sign Source: E. J. Elton, M. J. Gruber, and T. J. Ut

1978), 1378.

^{&#}x27;For a study using another technique to adjust betas and reduce residual error, see Lawrence Fisher and Jules Kamin, "Forecasting Systematic Risk: Estimates of 'Raw' Beta That Take Account of the Tendency of Beta to Change and the Heteroskedasticity of Residual Returns," Journal of Financial and Quantitative Analysis, 20 (June 1985), 127–50.

Estimating Beta

a from history, using a fixedres regression. These models esring model, one where the (---) found that "the use of the will overestimate the portfolio coefficients are changing over riability from the residual risk, e relationship between residual

to eliminate some of the probcreating a beta coefficient that owever, these models have their

that much of the cause of beta They suggest that estimates of c data rely on the past returns, ed return. Thus, they say that ata can be expected to exhibit n the underlying ex-ante secuobey a stationary distribution

ent needed to estimate a beta. table, then researchers believe e beta is stable or predictable. methods of estimating the eir results down into error hu, but they did test some inns. The methods tested, which ky-Martin study, were the fol-

ige correlation coefficient for the

tfolio Residual Risk and Diversificais, 16 (March 1981), 95-112. st betas and reduce residual error, see tematic Risk: Estimates of 'Raw' Beta nge and the Heteroskedasticity of Reive Analysis, 20 (June 1985), 127-50. "The Telescopic Effect of Past Return Review, 19 (March 1984), 1.

- A perfect correlation of 1.0
- The Vasicek method, similar to the Bayesian method described pre-
- The full historical method, which uses the average coefficient of five years of data for the particular stock or portfolio

Their results, shown in Exhibit 4-24, indicate that in both time periods studied, the overall mean was the superior method of predicting correlations-better than the more sophisticated methods. The overall mean is a very cynical method of forecasting. It is tantamount to saying that the best forecast is just an average for the whole sample. Any added efforts to refine the estimate for a single security are fruitless.

In a more recent study of a variety of commercially available beta services, Harrington (1981) found that some services did demonstrate a measure of forecast skill. Although none of the forecasts were accurate, some did perform better than others and did so consistently. The study results for a sample of utility stocks are shown in Exhibit 4-25. These results are those for a forecast horizon of three years. Although a number of periods and samples were tested in the study, the magnitude of the errors is similar. The study also looked at the use of these betas in the CAPM framework to forecast returns and found those were even more difficult to forecast.

Thus, we find that betas for individual securities are not particularly stable, nor do most securities remain in the same risk class from one period to another. Analysis of mean-squared errors shows that although some components of error can be reduced, the major portion of standard error can be lessened only by adding more securities to the portfolio. Finally, we find that the best way to estimate a correlation coef-

Exhibit 4-24 Average Absolute Error* for Correlation Coefficient Forecasts

FIRST FIVE YE	ARS	SECOND FIVE Y	EARS	COMBINED	
1. Overall Mean	.1169	1. Overall Mean	.1415	1. Overall Mean	.1292
2. Blume Beta	.1270	2. Blume Beta	.1499	2. Blume Beta	.1385
Vasicek Beta	.1289	Unadjusted Beta	.1539	3. Vasicek Beta	.1419
4. Unadjusted Beta	.1348	4. Full Historical	.1545	4. Unadjusted Beta	.1444
5. Beta = 1	.1378	5. Vasicek	.1548	5. Full Historical	.1491
6. Full Historical	.1436	6. Beta = 1	.1776	6. Beta $=1$.1577

^{*}All differences are statistically significant unless grouped by a bracket.

Source: E. J. Elton, M. J. Gruber, and T. J. Urich, "Are Betas Best?" Journal of Finance, 33 (December 1978), 1378.

Exhibit 4-25
Forecast Errors from Commercially Available Beta Sources
(Based on Three-Year Horizon for 52 Utilities)

	MEAN SQUARED ERROR	BIAS	INEFFI- CIENCY	RAN- DOM ERROR	MEAN FORE- CAST
Beta = sample mean Beta = 1 Market Model Market Model	.086635 .227116 .093383	.047169 .189320 .021973	.006294 .000773 .049222	.033171 .037023 .022188	.6348 1.0000 .4709
(adjusted) Merrill Lynch Merrill Lynch	.091748 .122362	.028899 .053966	.031198 .046581	.031649 .021815	.5933 .6348
(adjusted) Barr Rosenberg	.135069	.079422	.033839	.021806	.7031
(historical) Barr Rosenberg	.114077	.054682	.036136	.023257	.7554
ishort-term fundamental) Barr Rosenberg (long-	.099353	.058151	.009978	.031223	.7860
term fundamental) Value Line	.116526 .079898	.076802 .038051	.008655 .010821	.031066 .031025	.8312 .7241

Source: D. R. Harrington, "Predicting Returns Using Commercially Available Beta Forecasts" (Paper presented at the Southern Finance Association Meeting, November 1981), p. 11.

ficient is to use the average coefficient for an entire universe of stocks. If historical betas are not particularly stable and we cannot refine them significantly, they cannot be very useful in estimating future betas. After reviewing these data, one of my colleagues commented: "Stock betas are very nearly random variables with almost no economic content." Is that so?

5. IMPACT OF MACROECONOMIC CHANGE ON BETA: THE IMPACT OF INTEREST RATES

If beta changes over time, perhaps it is due to fundamental shifts in the structure of the economy—major political, social, or economic events, not just randomness. McDonald (1985) suggested that "if an extended inflationary period caused a structural shift in the market components, the significance of an inflation factor appended to the single-factor CAPM would simply reflect the rigidity of a static model." Using a method that could identify any cross-sectional shifts concentrated in a single pe-

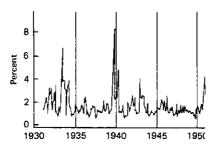
Portfolio Management, Winter 1985, p. 20.

riod, he found, as shown in Exhib in 1933, 1939-41, and 1974-75. 'nomic upheavals. On the basis of analysts or researchers using hist choice of a time period over whic major periods of nonstationarity.

The major structural chang companied by major changes in counts for uncertainty about the the levels of interest rates. Exhit line is uncertain, the analyst is un occur, and that the returns for 1 Distributions X, Y, and Z represassets with betas of 0.5, 1.0 and 1 are shown sideways, to demonst accounted for in this risk is the p interest rates, that is, changes in

Some researchers have looke changes on the systematic risk a widely used in analyzing bonds, yield-curve shifts on the price of

Ext.
Percent of Securities with Si



Source: Adapted from Bill McDonald, "Maki Portfolio Management, Winter 1985, p. 21.

²⁰Duration is a measure of the year ent value terms. For a general description and Rupinder S. Sidhu, "The Many Uses 36 (July-August 1980), 58-72. See Rona curity Risk," *Journal of Financial and Qu* for a description of duration as it applies

Item 14, page 35

vailable Beta Sources

INEFFI- CIENCY	RAN- DOM ERROR	MEAN FORE- CAST
.006294	.033171	.6348
.000773	.037023	1.0000
.049222	.022188	.4709
.031198	.031649	.5933
.046581	.021815	.6348
.033839	.021806	.7031
.036136	.023257	.7554
.009978	.031223	.7860
.008655	.031066	.8312
.010821	.031025	.7241

nmercially Available Beta Forecasts " (Paper ovember 1981), p. 11.

or an entire universe of stocks.

able and we cannot refine them
n estimating future betas. After
mmented: "Stock betas are
economic content." Is that

BETA:

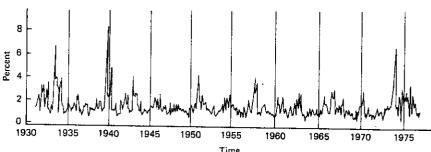
ue to fundamental shifts in the social, or economic events, not sted that "if an extended inflant the market components, the led to the single-factor CAPM atic model." Using a method fts concentrated in a single pestable Alphas and Betas," Journal of

riod, he found, as shown in Exhibit 4-26, that significant shifts occurred in 1933, 1939-41, and 1974-75. These shifts coincided with major economic upheavals. On the basis of these results, McDonald suggested that analysts or researchers using historical data must exercise caution in the choice of a time period over which to estimate a beta, in order to avoid major periods of nonstationarity.

The major structural changes that McDonald identified were accompanied by major changes in interest rates. Notice that the beta accounts for uncertainty about the economic scenario, not for changes in the levels of interest rates. Exhibit 4-27 shows that because the market line is uncertain, the analyst is uncertain whether scenario A, B, or C will occur, and that the returns for higher beta assets are more uncertain. Distributions X, Y, and Z represent the systematic risk associated with assets with betas of 0.5, 1.0 and 1.5, respectively. Note, the distributions are shown sideways, to demonstrate the systematic risk. What is not accounted for in this risk is the potential for shifts in the overall level of interest rates, that is, changes in the intercept.

Some researchers have looked explicitly at the effect of interest rate changes on the systematic risk of assets. Borrowing a measure of risk widely used in analyzing bonds, duration, 20 a measure of the impact of yield-curve shifts on the price of a bond, they have attempted to meld

Exhibit 4-26
Percent of Securities with Significant Shift 1931-75 (monthly)

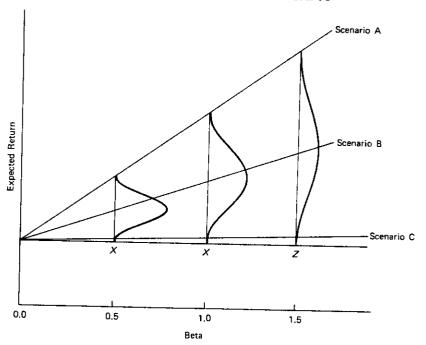


Source: Adapted from Bill McDonald, "Making Sense Out of Unstable Alphas and Betas," Journal of Portfolio Management, Winter 1985, p. 21.

²⁰Duration is a measure of the years until half the investment will be received in present value terms. For a general description of bond duration and its uses, see Frank K. Reilly and Rupinder S. Sidhu, "The Many Uses of Bond Duration," *Financial Analysts Journal*, 36 (July-August 1980), 58-72. See Ronald Lanstein and W. F. Sharpe, "Duration and Security Risk," *Journal of Financial and Quantitative Analysis*, November 1978, pp. 653-68, for a description of duration as it applies to equities.

Exhibit 4–27

Multiscenario Risk and the CAPM



interest rate risk with the kind of risk inherent in the CAPM. Boquist, Racette, and Schlarbaum (1975) show that a security's beta can be described as a function of duration. There has been considerable discussion²¹ about the relevance of this measure, whether it captures systematic, or unsystematic risk, and how it might be used. While this certainly is an innovative attempt to join two sorts of risk, we are not certain of its usefulness. Nevertheless, at least one money management organization has created duration betas.²² These duration betas can be quite different from the betas for the securities. Exhibit 4–28 provides a list of the expected rates of return, durations, betas, and duration betas (the duration of the stock divided by the duration of the market). The

²¹See, for instance, R. Lanstein and W. F. Sharpe, "Duration and Security Risk," Journal of Finance and Quantitative Analysis, 13 (November 1978), 653-68; M. Livingston, "Duration and Risk Assessment for Bonds and Common Stocks: A Note," Journal of Finance, 33 (March 1978), 293-95; and John S. Bildersee and G. S. Roberts, "Beta Instability When Interest Rate Levels Change," Journal of Financial and Quantitative Analysis, 16 (September 1981), 379-80.

²²Drexel, Burnham, Lambert, Inc., has published duration betas.

Analysts' Estima

Ex

•	EXPECTED RETURN
McDonald's	12.7%
Times Mirror	12.9
Digital	11.6
Baxter Travernol	11.7
Northwest Bankcorp	13.4
Western Bankcorp	15.8
Burroughs	10.9
Manufacturers Hano-	
ver Bank	14.6
Pfizer	11.7
Jefferson Pilot	11.7
Middle South Utili-	
ties	15.3
Kimberly Clark	14.2
Eastman Kodak	11.4
Gulf Oil	16.1
Revion	11.1
Mobil	15.2
American Home	
Prods.	11.3
International Har-	
vester	17.7
IBM	11.9

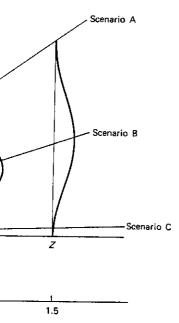
Source: Adapted in part from Tony Estep, N Common Stocks," Journal of Portfolio Mana

expected rates of return are estin management organization; the d alysts. The information in the d ample of how beta, the risk of s pact of changes in interest rates the risk an investor may be tak

Still, beta (or relative vola kind of risk that should be impo and will vary from our forecasts securities are profoundly influ events. Other firms' returns hav dominated by microeconomic, ment, market power, patent pro less, no firm and thus no securit

Item 14, page 37

he CAPM



therent in the CAPM. Boquist, 24 a security's beta can be de
has been considerable endre, whether it captures systemight be used. While this cervo sorts of risk, we are not certleast one money management. These duration betas can be curities. Exhibit 4-28 provides itions, betas, and duration betas eduration of the market). The

harpe, "Duration and Security Risk," ovember 1978), 653-68; M. Livingston, mmon Stocks: A Note," Journal of Fiee and G. S. Roberts, "Beta Instability nancial and Quantitative Analysis, 16

hed duration betas.

Exhibit 4-28
Analysts' Estimates of Risk and Return

	EXPECTED RETURN	ВЕТА	DURATION	DURATION BETA
McDonald's	12.7%	1.53	35.7	1.31
Times Mirror	12.9	1.33	24.3	0.86
Digital	11.6	1.27	42,3	1.51
Baxter Travernol	11.7	1.19	41.3	1.51
Northwest Bankcorp	13.4	1.17	23.9	· -
Western Bankcorp	15.8	1.09	16.4	0.88
Burroughs	10.9	1.09	43.8	0.60
Manufacturers Hano-		1.00	40.0	1.61
ver Bank	14.6	1.07	17.4	0.04
Pfizer	11.7	1.07	30.4	0.64
Jefferson Pilot	11.7	1.03	31.4	1.12
Middle South Utili-		1.00	51.4	1.15
ties	15.3	1.03	14.0	0.51
Kimberly Clark	14.2	0.98	19.0	0.51
Eastman Kodak	11.4	0.98	33.6	0.69
Gulf Oil	16.1	0.97	33.6 14.4	1.23
Revlon	11.1	0.97	36.4	0.53
Mobil	15.2	0.96		1.35
American Home	10.2	0.30	16.3	0.60
Prods.	11.3	0.96	99.0	
International Har-	11.0	0.50	33.2	1.22
vester	17.7	0.96	19 5	
IBM	11.9	0.95	13.5 28.7	0.50 1.06

Source: Adapted in part from Tony Estep, N. Hanson, and C. Johnson, "Sources of Value and Risk in Common Stocks," Journal of Portfolio Management, Summer 1983, p. 8.

expected rates of return are estimates made by the analysts at one money management organization; the durations were also developed by the analysts. The information in the exhibit is meant only to provide an example of how beta, the risk of systematic change, and duration, the impact of changes in interest rates, can lead to quite different ideas about the risk an investor may be taking with any security.

Still, beta (or relative volatility) does represent a very important kind of risk that should be important to investors: over time, returns do and will vary from our forecasts. Some firms and the returns from their securities are profoundly influenced by socioeconomic and political events. Other firms' returns have been (and perhaps will continue to be) dominated by microeconomic, firm-specific factors: superior management, market power, patent protection, or process innovation. Nonetheless, no firm and thus no security can escape the direct or indirect effects

of events in the larger world. It is the desire to find a way to measure this macroeconomic sensitivity that spurs the search for a better beta. Despite the instability of historical betas, the concept of beta is not easily dismissed.

III. FUNDAMENTAL AND CREATIVE BETA PREDICTION

Many analysts believe that we are simply putting too much emphasis on history. Beta is likely to appear nonstationary because a firm's risk conditions change. The problem with instability is that we do not know whether risk is changing or whether our statistical techniques are at fault. History, as usual, presents problems and the future remains unknown.

Other methods of estimating beta have been devised. Beaver, Kettler, and Scholes (1970) attempted to understand the underlying determinants of beta. If we knew what determined beta, we could then use the same factors to estimate it. Beaver, Kettler, and Scholes used ratios from the firms' financial statements and then regressed these ratios against betas derived using the market model. This method, called multivariate analysis, is similar to the market model, but the regression includes a larger number of variables in the formula.

Exhibit 4-29 shows the coefficients of the regressions that Beaver, Kettler, and Scholes formed. Their regressions were more stable than those derived using simple historical returns and showed promise for better beta estimates. Remember, however, that these data were still cal-

Exhibit 4-29

Contemporaneous Association of Beta with Accounting Measures of Risk (Correlation Coefficients)

	INDIVIDUAL STOCKS		PORTFOLIOS (5 STOCKS)	
	1947-56	1957-66	1947-56	1957-66
Payout	49	29	79	
Growth	.27	.01	=	50
Leverage	.23	: =	.56	.02
Liquidity ratio	13	.22	.41	.48
Size of firm		.05	~.35	.04
EPS variability	06	16	09	30
	.66	.45	.90	.82
l'otal returns	.44	.23	.68	.46

Source: W. Beaver, D. Kettler, and M. Scholes, "The Association between Market Determined and Accounting Determined Risk Measures," Accounting Review, 45 (October 1970), 669.

culated from historical data—but addition to historical returns.

Other researchers have dev of beta is called fundamental be specific variables that we believe a security's risk. Rosenberg and ultimately produced Rosenberg's six categories to develop beta es market variability category, factorion (such things as historical bethe residual errors) were ranked study. Such factors as price-ear ranked in importance as numbethough called fundamental, the faderived from the market model

By the way, Rosenberg and systematic (microeconomic) risk source of a substantial portion of thermore, the error from the regr suspect that unsystematic risk able.

Corporate financial experterage (the amount of debt finan leverage (the relationship of fix factors that affect the risk of a should also be determinants of

Hamada (1972) described the have on the beta of a stock; (McKibben (1973), Logue and Me (1970), Breen and Lerner (1973), (1980), and Fuller and Kerr (198 the impact of the effect of lever

²³See, for example, D. J. Thompso Journal of Business, 46 (1973), 173-87, earnings multiples, and asset growth. A fundamental determinants of beta: N. Go counting Numbers''; William Beaver an Determined and Accounting-Determined dence,'' Journal of Financial and Quant Rosenberg and W. McKibben, "The Pre Stock," Journal of Financial and Quant

²⁴Ned C. Hill and B. K. Stone, in and Financial Leverage: A Risk-Compos Risk," *Journal of Financial and Quantiti* marize the research in the area of deter beta, in addition to examining the impa esire to find a way to measure rs the search for a better beta. concept of beta is not eas-

CREATIVE BETA N

putting too much emphasis on mary because a firm's risk conbility is that we do not know atistical techniques are at fault. the future remains unknown, ave been devised. Beaver, Ketderstand the underlying determined beta, we could then use tettler, and Scholes used ratios d then regressed these ratios nodel. This method, called multimodel, but the regression interformula.

of the regressions that Beaver, essions were more stable than ms and showed promise for betthat these data were still cal-

a with Accounting Measures Coefficients)

CKS	_	OLIOS OCKS)
'-66	1947-56	1957-66
29	79	50
01	.56	.02
22	.41	.48
05	35	.04
16	09	30
45	.90	.82
23	.68	.46

sociation between Market Determined and ew, 45 (October 1970), 669.

culated from historical data—but historical financial ratios were used in addition to historical returns.

Other researchers have developed fundamental betas. ²³ This type of beta is called *fundamental* because it is based on many of the firm-specific variables that we believe—intuitively or theoretically—can affect a security's risk. Rosenberg and Marathe (1975), in a major study which ultimately produced Rosenberg's fundamental beta, used 54 factors in six categories to develop beta estimates. Eleven of the 14 factors in the market variability category, factors derived from a market model regression (such things as historical beta, beta squared, and beta multiplied by the residual errors) were ranked as the 11 most important factors in this study. Such factors as price-earnings ratio and return on equity were ranked in importance as number 40 and number 36, respectively. Although called fundamental, the factors of primary importance were those derived from the market model using historical returns.

By the way, Rosenberg and Marathe also attempted to predict unsystematic (microeconomic) risk. As we have seen, this risk can be a source of a substantial portion of the total risk for individual assets. Furthermore, the error from the regressions is usually so large that we might suspect that unsystematic risk could instead be systematic or predictable.

Corporate financial experts have long believed that financial leverage (the amount of debt financing a company's assets) and operating leverage (the relationship of fixed and variable costs) are fundamental factors that affect the risk of a company. Thus, they conclude that they should also be determinants of the risk of a stock.

Hamada (1972) described the impact that changes in leverage should have on the beta of a stock; the results of tests by Rosenberg and McKibben (1973), Logue and Merville (1972), Beaver, Kettler, and Scholes (1970), Breen and Lerner (1973), Melicher and Rush (1974), Hill and Stone (1980), and Fuller and Kerr (1981) provide conflicting answers regarding the impact of the effect of leverage on beta.²⁴

²³See, for example, D. J. Thompson, "Sources of Systematic Risk in Common Stock," Journal of Business, 46 (1973), 173-87, who used covariant forms of dividends, earnings, earnings multiples, and asset growth. Among others, the following have also looked at the fundamental determinants of beta: N. Gonedes, "Evidence on the Information Content of Accounting Numbers"; William Beaver and J. Manegold, "The Association between Market-Determined and Accounting-Determined Measures of Systematic Risk: Some Further Evidence," Journal of Financial and Quantitative Analysis, 10 (June 1975), 231-84; and Barr Rosenberg and W. McKibben, "The Prediction of Systematic and Specific Risk in Common Stock," Journal of Financial and Quantitative Analysis, 8 (March 1973), 317-34.

²⁴Ned C. Hill and B. K. Stone, in "Accounting Betas, Systematic Operating Risk, and Financial Leverage: A Risk-Composition Approach to the Determinants of Systematic Risk," *Journal of Financial and Quantitative Analysis*, 15 (September 1980), 595-637, summarize the research in the area of determining the fundamental, corporate factors behind beta, in addition to examining the impact of operating and financial leverage.



138 Chapter 4

Creative practitioners are developing new approaches to estimating beta. For instance, researchers at Drexel, Burnham, Lambert (and earlier at Bache and Co. with American General Life Insurance Co.) have developed what they call a market-cycle beta. They contend that historical betas are better measured if strong trends in the stock market are taken into account. These betas are calculated by using history and are plotted over time. Exhibit 4-30 shows two of their beta series over time. The bar indicates the standard error of the beta; the dot in the middle is the estimated beta. The market cycles are indicated by the dates opposite each beta estimate. The usefulness of these betas remains to be seen.

1. CAN ANALYSTS ADD VALUE?

Fundamental betas are still being derived from historical measures of return and/or firms' risk characteristics and return changes relative to the market. In analyzing historical returns or considering the firm's future risk characteristics, can the analyst add value to the beta estimate by forecasting some of the conditions that will affect future fundamental beta measurement? We don't know for sure. Let us examine the question further by looking at the results of a study that uses analysts' estimates to mechanically adjust betas.

Using data from Lynch, Jones and Ryan, a firm that tracks analyst forecasts, Carvell and Strebel (1984) developed a beta adjusted by the uncertainty of analysts' forecasts. Since analysts' forecasts of beta are not available, Carvell and Strebel developed a beta from earnings forecasts. They contend that if the standard error of the beta from a historical regression analysis and/or the analysts' forecast variance is small, estimation risk is not important. This, they say, is the case with the stocks of large, well-researched firms. In fact, they suggest that estimation error is inversely related to market value size—and the number of analysts following the firm. Carvell and Strebel placed each stock into a portfolio according to the number of analysts that followed it. They believed that if they could eliminate unlikely results, such as a size effect, that their adjusted beta would be superior. As shown in Exhibit 4-31, they found that their adjusted betas outperformed the simple, historical beta, at least for the period they tested, 1976 to 1981. The excess return for lightly followed stocks of 0.0023 that was derived when the historical beta was used dropped to 0.0004 using their analyst-adjusted beta-the abnormal returns virtually disappeared. This study is one of the few that has used analyst forecasts to adapt historical beta.

In addition to this mechanical adaptation of beta for analysts' forecasts, practitioners have been using beta and adapting it for some time. Fouse (1976), a practitioner interested in adapting the elegant but cantankerous CAPM for use as a portfolio management tool, attempted to

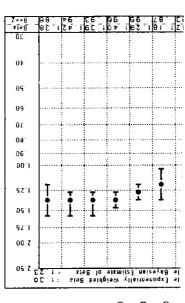


Exhibit 4-30

Market-Cycle Betas

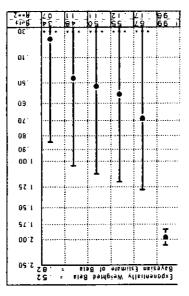
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2/27/79 T0 2/20/81

1/26/79 T0 1/06/81

11/14/78 T0 12/11/80

9/12/78 T0 3/27/80



Itam 14, page 41

Market-Cycle Betas

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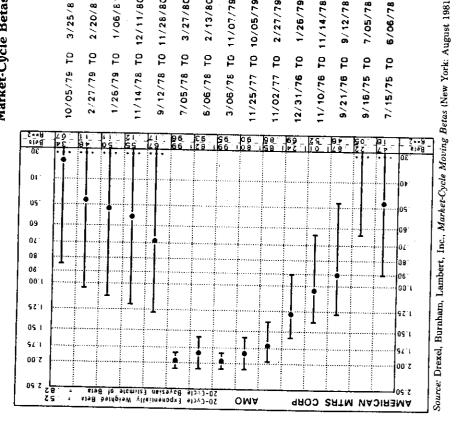
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09 07 08 00.1 92.1 09:1 9411 1.75 00 Z \$ 00 20-Cycle Exponentially Weighted Bela 20-Cycle Bayesian Estimate of Beta ATLANTIC RICHFIELD CO **DHA**

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139

Exhibit 4-31

		EXCESS RETURNS— NEW RETA	0039* 0019
Porecasts		EXCESS RETURNS— HISTORICAL BFTA	0032* .0005 .0023*
ed for Analyst I		RETURN	.009** .013*
s Betas Adjuste	,	NEW BETA	1.278* 1.685* 1.822*
Portfolio Risks and Excess Returns Betas Adjusted for Analyst Forecasts		HISTORICAL BETA	1.038* 1.135* 1.209*
olio Risks and		COEFFI. CIENT OF VARIATION	.050* .086* .101*
Port		AVERAGE NO. OF ANALYSTS	22 11 4
		PORT. FOLIO	3 2 3

Source: S. Carvell and P. Strebel, "A New Beta Incorporating Analysts' Forecasts," The Journal of Portfolio Management, Fall 1984, pp. 83-84. *Significant at 95% percent level or above.

Estimating Beta

join modern capital market theory theory. He felt that academics, in tignored price formation in order to struction of portfolios. Thus, acadex post data, data that could neven other academics. Fouse argue estimate based on (1) the financia (2) the degree to which a firm's bubeta should be predictable. Fous traditionally been concerned with add value.

Analyst-estimated or analys used by practitioners and will un as other beta-prediction technique ing long enough to yield adequat

2. CAN BETAS BE USED FOR PRACTIC

Because we have discussed major certainly ask whether we can stil way to answer this question is to of betas. In our example firm, ar

- 1. Five years of expected ϵ
- Five years of expected •
- Five years of expected ¿
- . A payout ratio
- 5. A return on equity
- 6. A projection of growth
- Beta, usually using a m lyst

The first six factors are turned return for the stock in questio discount model. 25 they find the e

²⁵The dividend-discount model is

 $P_{\alpha} =$

where

P = mark D = divid n = the y R = the e $\Sigma = \text{the s}$

Item 14, page 43

S. Carvell and P. Strebel, "A New Beta Incorporating Analysts' Forecasts," The Journal of Portfolio Management, Fall 1984, pp. 83-84

join modern capital market theory with old, fundamental, classical value theory. He felt that academics, in their attempts to implement the CAPM, ignored price formation in order to concentrate on the behavior and construction of portfolios. Thus, academics could test their models only with ex post data, data that could never convince professional investors or even other academics. Fouse argued that because beta is an expectational estimate based on (1) the financial risk and business risk of a firm and (2) the degree to which a firm's business covaries with the total economy, beta should be predictable. Fouse expected that because analysts had traditionally been concerned with these problems, their estimates should add value.

Analyst-estimated or analyst-adjusted betas are increasingly being used by practitioners and will undoubtedly be tested just as rigorously as other beta-prediction techniques when institutions have been predicting long enough to yield adequate data for a test.

2. CAN BETAS BE USED FOR PRACTICAL PURPOSES?

Because we have discussed major problems in estimating beta, we must certainly ask whether we can still use beta in practice. Perhaps the best way to answer this question is to describe the use that one firm has made of betas. In our example firm, analysts make projections for

- 1. Five years of expected dividends
- 2. Five years of expected earnings
- 3. Five years of expected growth
- 4. A payout ratio
- 5. A return on equity
- 6. A projection of growth after the initial five years
- 7. Beta, usually using a market model estimate adjusted by the analyst

The first six factors are turned into a forecast of the expected rate of return for the stock in question. Using a variation of the dividenddiscount model, 25 they find the expected return. For example, in Exhibit

25 The dividend-discount model is

$$P_O = \sum_{n=1}^{\infty} \frac{D_n}{(1+R)^n}$$

where

= market price at time 0

dividends

the year from year 1 to infinity (∞)

the expected rate of return

the sum

Analysts' Forecasts Used to Estimate Returns

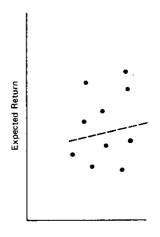
										•	0.00		:	implicit ROE: 18.7%	8.7%	
										GROW	GROWTH & TRANS.	ANS.				
	٠											ĺ				ZEX.
	STOCK	PRICE	DBL		EPS	CHG.	DIV.	CHG.	PAYT. RATIO	GROWTH ILMPL. RATE ROF	ILMPL. ROF	ADD.		TRANS, EXP. RTN.	EXP.	CON.
American Mo-	SS	3.50	0.82	1980	-6.00		8		200				<u> </u>	DEIA	JUKN	THIB.
tors Corp.				1981	-3.00	I	00.0		20.0%	5.0%	6.3%	4	2	1.17	17.0%	18.5%
(AMO)				1982	-1.00	ı	0.00									14.8%
				1983	0.75	ļ	0.15	1								66.7%
				1984	1.50	100.0	0.30	100.0								
				1985	1.57	9.0	0.31	5.0								
				Eps G	Eps Growth 1980 to 1985	80 to 19.	35	98.1%								
;				Div Gr	Div Growth 1980 to 1985	80 to 198	5	31.0%						ROR1 =	= 3.5%	
Ford Motor	N ₂	19.88	0.40	1980	-12.83		1.20	2	27.9%	5.00%	800	c	,	,		
Co. Del (F)				1981	-7.00	ı	1.20	0.0	2	2.5	0.5	ņ	۵,	0.67	20.3%	38.4%
				1982	1.60	ļ	1.20	0.0								18.2%
				1983	13.00	712.5	2.00	66.7								43.4%
				1984	13.00	0.0	3.00	50.0								
				1985	10.76	-17.2	3.00	0.0								
				Eps Gr	Eps Growth 1980 to 1985	80 to 198		214.4%								
	i			Div Gr	Div Growth 1980 to 1985	30 to 198		25.1%						ROR1 = 29.8%	29.8%	
General Mo-	В1	45.75	0.41	1980	-2.65		2.95		48.6%	5.0%	9 70%	e	L		:	
tors Corp.				1981	4.75	1	3.05	3.4	:	2		,	o	6.59	19.4%	49.4%
(MD)				1982	11.25	136.8	5.50	80.3								17.8%
				1983	16.00	42.2	7.50	36.4								32.8%
				1984	14.70	-8.1	7.50	0.0								
				1985	15.43	5.0	7.50	0.0								
				Eps Gr	Eps Growth 1980 to 1985	30 to 198		128.6%								
				Div Gre	Div Growth 1980 to 1985	0 to 198		24.5%						RORI = 22.5%	22.5%	

Estimating Beta

4-32 the Drexel, Burnham, Lamb American Motors is 17 percent. organizations then take this retu each stock and portray them as dots, one for each stock, a line of plotted. This line, like the dashed or the expected marketwide risklysts. Theoretically, all stocks sh perfectly efficient. Obviously, he

The distance that any dot l of-risk) line is called its *superior*, vestment firms using this approstock's relative attractiveness. ²⁶ ting above the line) are expected provide a superior return for th line are stocks with less attractive should be reconsidered if they are not be purchased.

Expected Return and I



²⁶Recall that there have been a n the excess return, could have come fror and betas adapted for analysts' estima the excess returns. Care must be taken errors. The analyst faced with an exces tential for profit—that is, whether the 1

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19.4% ROR1 = 29.8%ROR1 = 22.5%0.59Growth 1980 to 1985 Div Growth 1980 to 1985 45.75 Bl Jeneral Mo-

Analysts' Long Term Earnings and Dividend Forecasts (New York: September 1981

Drexel, Burnham, Lambert, Inc.,

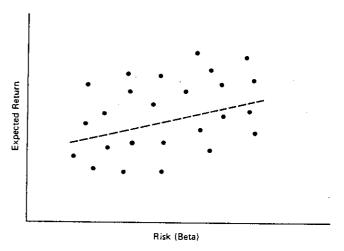
Source:

4-32 the Drexel, Burnham, Lambert, Inc., analysts' estimated return for American Motors is 17 percent. Some money investment management organizations then take this return forecast and an estimate of beta for each stock and portray them as shown in Exhibit 4-33. To this sea of dots, one for each stock, a line of best fit (a least-squares estimate) is plotted. This line, like the dashed line in Exhibit 4-33, is the consensus or the expected marketwide risk-return trade-off forecast by these analysts. Theoretically, all stocks should plot on the line if the market were perfectly efficient. Obviously, here they do not.

The distance that any dot lies from the trade-off (or market-price-of-risk) line is called its *superior*, *risk-adjusted return*, or *alpha*. The investment firms using this approach believe that the alpha indicates the stock's relative attractiveness. ²⁶ Those stocks with positive alphas (plotting above the line) are expected to outperform the market—that is, to provide a superior return for their risk. The stocks plotting below the line are stocks with less attractive prospects than average. These stocks should be reconsidered if they are already held, but they should certainly not be purchased.

Exhibit 4–33

Expected Return and Risk for a Universe of Stocks



²⁶Recall that there have been a number of studies that have found that the alpha, the excess return, could have come from the misestimation of beta. Time-varying models and betas adapted for analysts' estimates seem to have significantly reduced the size of the excess returns. Care must be taken to separate real excess returns from estimation errors. The analyst faced with an excess return should determine whether it is a real potential for profit—that is, whether the return is more than enough to offset the risk.

This example of one use of beta is one of the curious uses of efficient-market theory. A theoretical concept based on market efficiency is used to identify market inefficiencies—undervalued and overvalued securities. Despite the paradox, the process may be fruitful.

IV. CONCLUSION

We know

That simple changes in the parameters of a time-series beta can result in a significant change in the resulting beta. (We do not know which are the best ways to make estimates. Consistency is a stopgap policy.)

That time-series betas are not good predictors of single-asset future betas.

That beta is a summary measure and may prove to be too austere. Much that underlies the movements of returns in the marketplace may be better described by a richer model than the CAPM. Unsystematic risk may not be irrelevant—even in the portfolio context.

Despite these disheartening results, it is still too soon to reject beta. Academics and practitioners are using beta and are developing better tests of the predictive value of beta. More important, they are working to unravel the problems of estimating beta and are using beta to make better stock selections, examine performance, and create portfolios. We have learned that we cannot simply extrapolate the future from the past. But analysts exercising careful judgment can interpret historical data and add judgment and insight in an effort to predict the future.

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cł

Estim Risk-F

The risk-free rate (R_f) is the lease Whether in academic research of the 90-day Treasury bill rate hather risk-free asset. Remember the free rate, which must be estimated must be.

The risk-free rate is usually as the minimum rate of return (premium $(R_m - R_f)$). Thus, an enturn would lead to a misestima asset or portfolio. The risk-free for examining historical results alphas. Choosing an incorrect riwould misunderstand the source performance, or have poor data it is important that we examin accept the customary 90-day 1 tion. In this chapter we will d and theoretical problems evide asset.

Itam 14, page 51

Responses of the Attorney General's Witness
Carl G. K. Weaver to
Commonwealth of Kentucky PSC Case No. 2003-00334
And Case No. 2003-00335
Louisville Gas and Electric Company's and Kentucky Utilities Company's
Initial Requests for Information

15. In reference to Dr. Weaver's Schedule 38, provide individual-company cost of equity calculations for each of the growth rates utilized.

Answer:

The cost of equity was calculated in Schedule 38 using the growth rate averages that are shown in Schedules 33, 34, and 35. The purpose of using average of the measures from the five company groups rather than using data from individual companies is to create a composite value that is best representative of KU and of LG&E. For this reason, I did not perform individual-company cost of equity calculations. It would have been incorrect to have done so.

Responses of the Attorney General's Witness Carl G. K. Weaver to Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335 Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

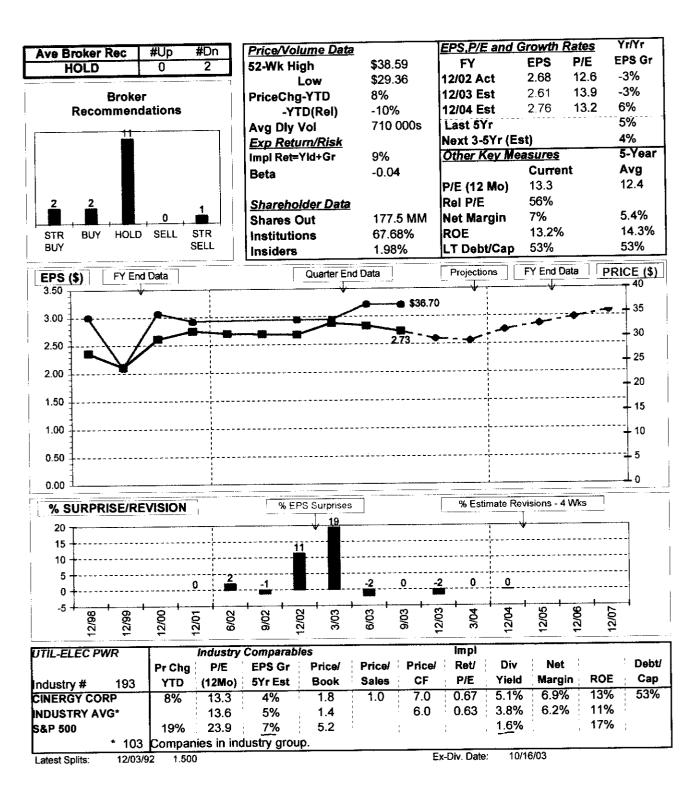
16. Provide a copy of the source document for each of the four projections for each company shown on Schedule 35.

Answer:

The requested source documents are attached.

Zacka Con	ipany ito	,001.00			UTIL-ELEC PWR		Туре:	Large	Blend
Rec Price	P/E	Mkt Cap	Div Rate	Yield	Sales (12Mo)	SIs Gr			
\$36.31	13.3	\$6445 MM	\$1.84	5.1%	\$6725 MM	5%	5%	0%	Hold

Cinergy Corp. is one of the nation's leading diversified energy companies. Cinergy owns or operates electrical and heat plant generators that are either operational or under development domestically and internationally. It also has electric and gas transmission lines in the U.S. and abroad. Cinergy Solutions focuses on cogeneration, energy services and utility outsourcing for large industrials, municipalities, universities and other large energy consumers. Its customers include BP Amoco, Kodak and General Motors. (Company Press Release)

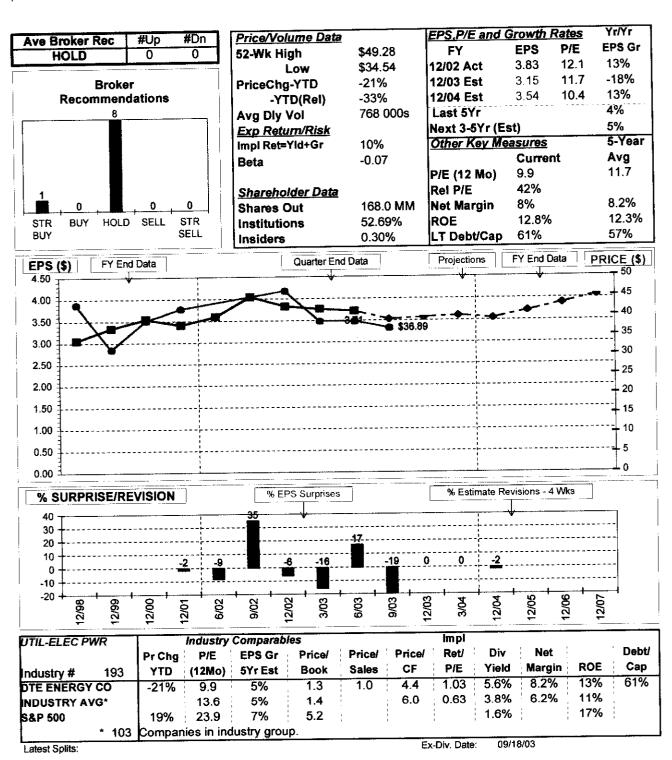


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Item 16, page 2

	Zacks	Com	ipany Ke	ероп аѕот	10/31/03						
1			<u>, , , , , , , , , , , , , , , , , , , </u>			Industry:	UTIL-ELEC PWR		1,36		Value
Į	Rec P	rico.	P/Ë	Mkt Cap	Div Rate	Yield	Sales (12Mo)	SIs Gr	EPS Gr	Div Gr	Zacks Rank
	\$36.		9.9	\$6196 MM	\$2.06	5.6%	\$6063 MM	14%	4%	0%	Sell
- 1	Ψ-00.	VU	3.0	Ψο του π	¥						

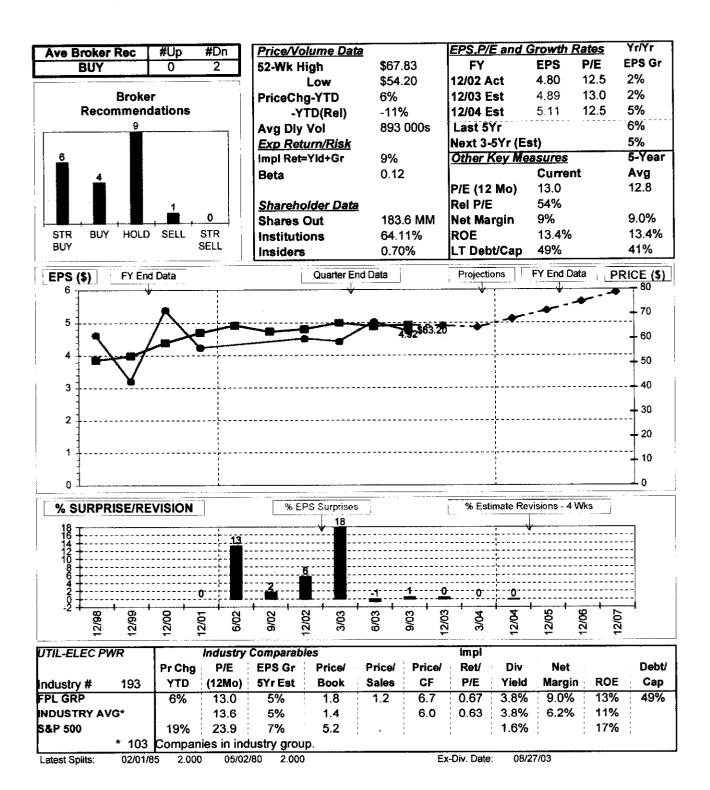
DTE Energy is a Detroit-based diversified energy company involved in the development and management of energy-related businesses and services nationwide. Its largest operating units are Detroit Edison, an electric utility serving 2.1 million customers in Southeastern Michigan, and MichCon, a natural gas utility serving 1.2 million customers in Michigan. Detroit Edison is the Company's principal operating subsidiary. Affiliates of the Company are engaged in non-regulated businesses, including energy-related services and products.



Zacks Company Report as of 10/31/03 Next EPS Report Date: 01/16/04

	JONE CON		Apple to the second			UTIL-ELEC PWR		1.75		Blend
R	Rec Price	P/E	Mkt Cap	Div Rate	Yield	Sales (12Mo)	SIs Gr	EPS Gr	Div Gr	Zacks Rank
1	\$63.74	13.0	\$11705 MM	\$2.40	3.8%	\$9635 MM	9%	6%	4%	Hold

FPL Group, Inc. is a public utility holding company. FPL Group's principal subsidiary, FPL, is engaged in the generation, transmission, distribution and sale of electric energy. FPL Group Capital, a wholly-owned subsidiary of FPL Group, holds the capital stock and provides funding for the operating subsidiaries other than FPL. In addition, FPL Group Capital formed a new subsidiary to sell wholesale fiber-optic network capacity.



Zacks Company Report as of 10/31/03 Next EPS Report Date: 02/05/04

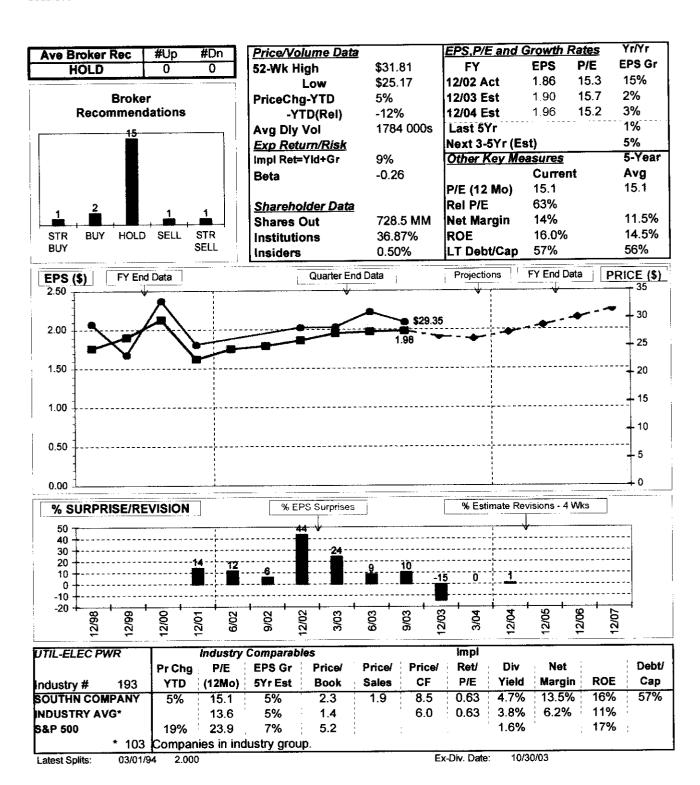
Zacks U	ompany Ke	sport as or	10/3 1/03						
<u> Luono</u>			e e e e e e e e e e e e e e e e e e e	Industry:	UTIL-ELEC PWR		Type:	Small	Blend
Rec Pric	e P/E	Mkt Cap	Div Rate	Yield	Sales (12Mo)	SIs Gr	EPS Gr	Div Gr	Zacks Rank
\$31.59	19.6	\$566 MM	\$1.35	4.3%	\$394 MM	9%	4%	1%	Hold

MGE Energy is a public utility holding company. Its principal subsidiary, MGE, generates and distributes electricity to more than 128,000 customers in Dane County, Wisconsin (250 square miles) and purchases, transports and distributes natural gas to nearly 123,000 customers in seven south-central and western Wisconsin counties (1,375 square miles). (Press Release)

Ave Broker Rec	#Up	#Dn	Price/Vo	ume Dat	a		EPS,P/E	and G	rowth	Rate	_	r/Yr
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HOED				Low	\$25.		12/02 Ad	:t	1.69	15.	8 4	%
Broke	3 5		PriceCho		18%		12/03 Es	it	1.92	16.	.5 1	4%
Recommen		!		D(Rel)	-1%		12/04 Es	it	2.02	15.	.6 5	%
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				(Jan 10 a 4a			Rel P/E	iiiO)	82%			•
	. 0 .	0		<u>Ider Data</u>			Net Mar	ain	7%		£	3.5%
0 0			Shares (gırı	12.2%			0.8%
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BU1		JULE	Insiders				LT Debt	/Cap	44%			70
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EPS (\$) FY Er	U Data											_□ 35
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ndustry# 193		19.6		2.3	1.4	9.4		4.3%	7.39		12%	44%
	18%				1	~ ~	0.00	2.00/	6.29	1	11%	
ndustry # 193 MGE ENERGY INC NDUSTRY AVG*	18%	13.6	5%	1.4	1	6.0	0.63	3.8%	0.27			1
MGE ENERGY INC	19%		5% 7%	1.4 5.2	1	6.0	0.03	3.6% 1.6%	0.27		17%	

Zauko	COIL	ipaily its	port as or	0,01,00						
			2.555			UTIL-ELEC PWR		· J P - ·	Large	Blend
Rec P	rice	P/E	Mkt Cap	Div Rate	Yield	Sales (12Mo)	SIs Gr	EPS Gr	Div Gr	Zacks Rank
\$29.	.80	15.1	\$21710 MM	\$1.40	4.7%	\$11206 MM	1%	1%	1%	Hold

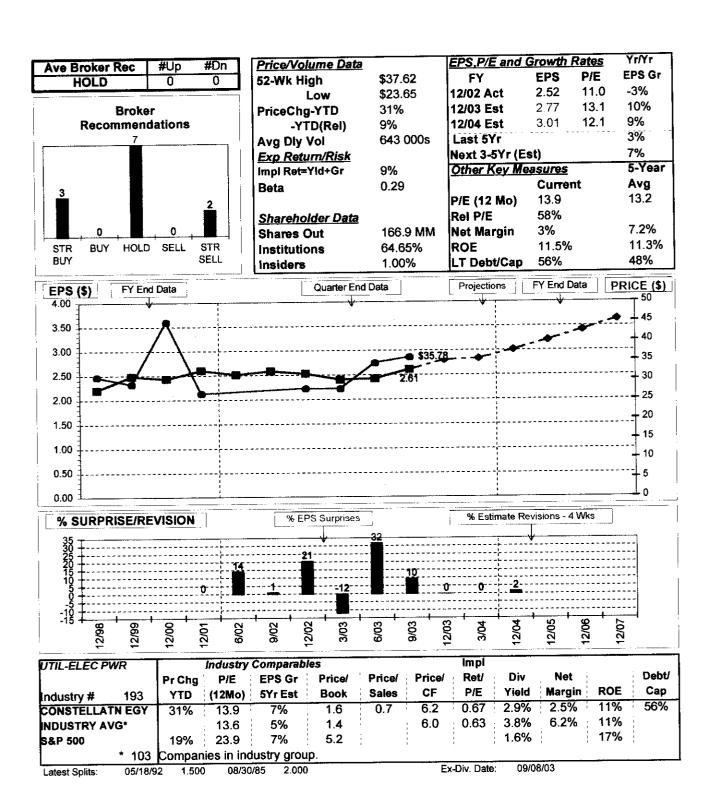
Southern Energy acquires, develops, builds, owns and operates power production and delivery facilities and provides a broad range of energy-related services to utilities and industrial companies in selected countries around the world. Southern Energy businesses include independent power projects, integrated utilities, a distribution company, and energy trading and marketing businesses outside the southeastern United States.



Zecks Company Report as of 10/31/03 Next EPS Report Date: 01/23/04

	Zacks Cor	npany re	eport as or	10/3//03						
ł				4.		UTIL-ELEC PWR		1.76	Large	Value
	Rec Price	P/E	Mkt Cap	Div Rate	Yield	Sales (12Mo)	SIs Gr			
	\$36.37	13.9	\$6070 MM	\$1.04	2.9%	\$8860 MM	15%	3%	-16%	Hold

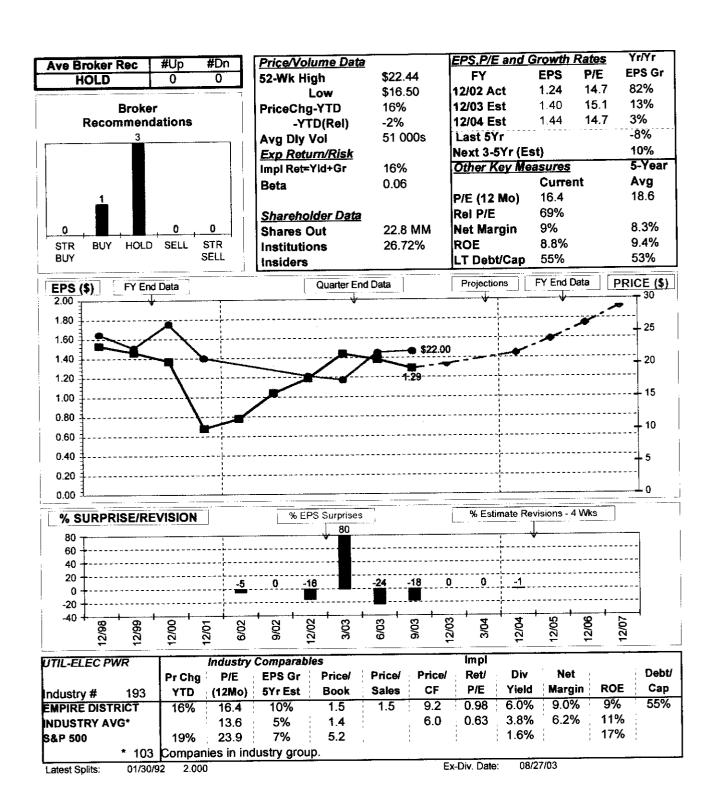
Baltimore Gas and Electric Company consists primarily of generating, purchasing, and selling electricity and purchasing, transporting, and selling natural gas.



Zacks Company Report as of 10/31/03 Next EPS Report Date: 02/05/04

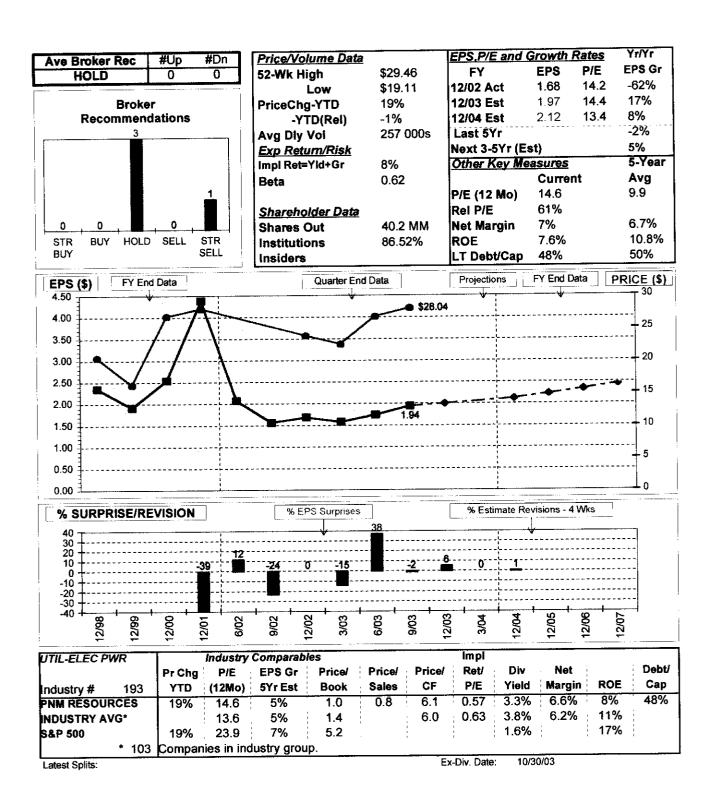
Zacks	Offiparty Kt	sport as or	0/01/00				Туре:	Small	Value
Rec Pric	e P/E	Mkt Cap	Div Rate	Yield	Sales (12Mo)		1		
\$21.20	16.4	\$484 MM	\$1.28	6.0%	\$324 MM	7%	-8%	0%	Seil

The Empire District Electric Company is an operating public utility engaged in the generation, purchase, transmission, distribution and sale of electricity in parts of Missouri, Kansas, Oklahoma and Arkansas. The Company also provides water service to several towns in Missouri.



Zacks Col	iipaiiy ixe	sport as or	5/01/00		UTIL-ELEC PWR		Type:		Value
Rec Price	P/E	Mkt Cap	Div Rate	Yield	Sales (12Mo)				4
\$28.28	14.6	\$1138 MM	\$0.92	3.3%	\$1414 MM	6%	-2%	3%	Buy

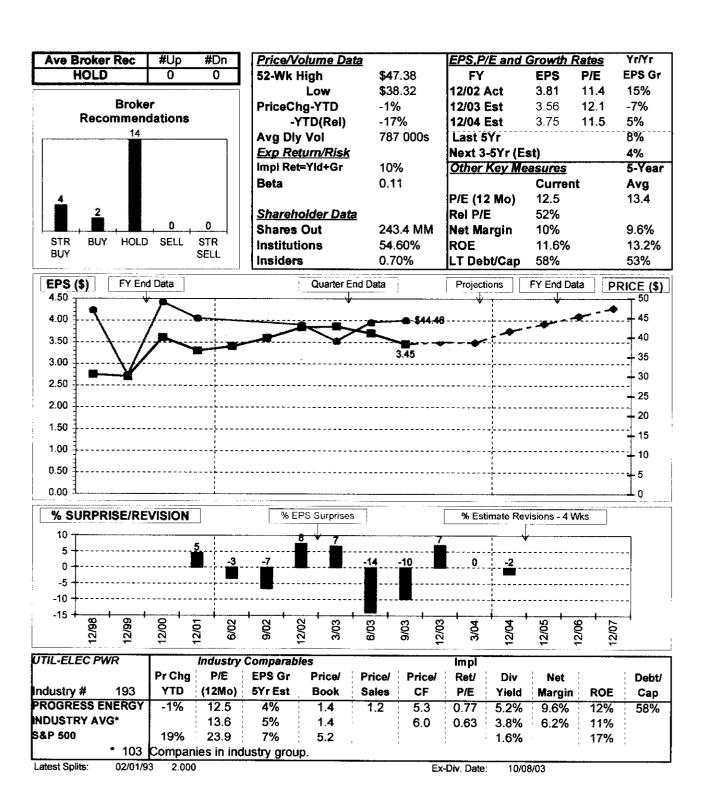
PNM Resources is an energy holding company based in Albuquerque, New Mexico. Its principal subsidiary is Public Service Company of New Mexico, which provides electric power and natural gas utility services to more than 1.3 million people in New Mexico. The company also sells power on the wholesale market in the Western U.S.



02/10/04

1					Industry:	UTIL-ELEC PWR	Type:	Value		
1	Rec Price	P/E	Mkt Cap	Div Rate	Yield	Sales (12Mo)	Sis Gr	EPS Gr	Div Gr	Zacks Rank
	\$43.10	12.5	\$10492 MM	\$2.24	5.2%	\$8406 MM	32%	8%	3%	Sell

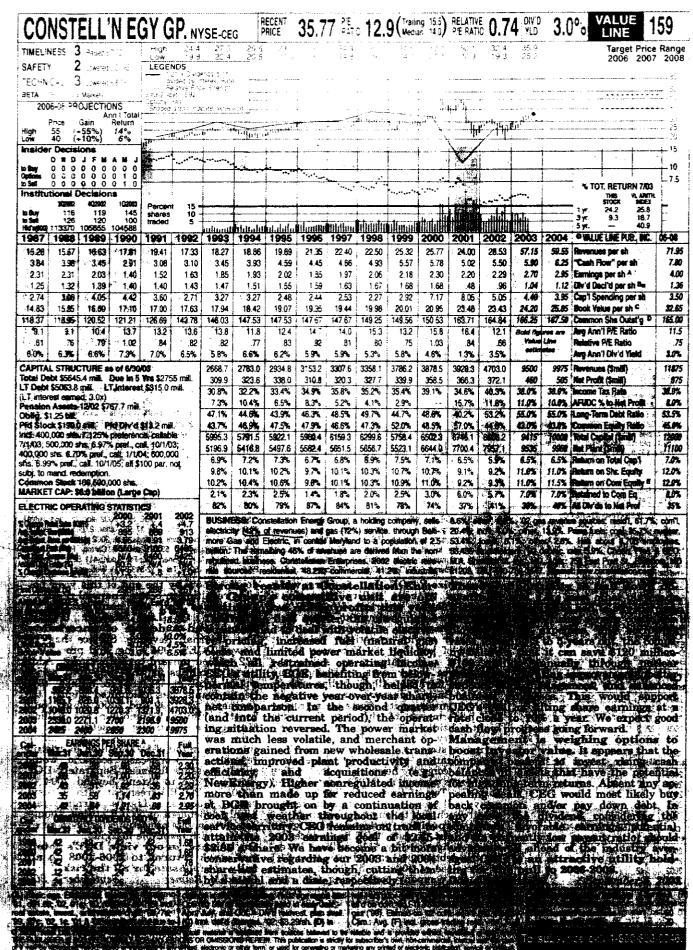
CP & L Energy, Inc. is primarily engaged in the generation, transmission, distribution and sale of electricity in portions of North and South Carolina and Florida and the transmission, distribution and sale of natural gas in portions of North Carolina. The company provides these and other services through its business segments: electric, natural gas and other.

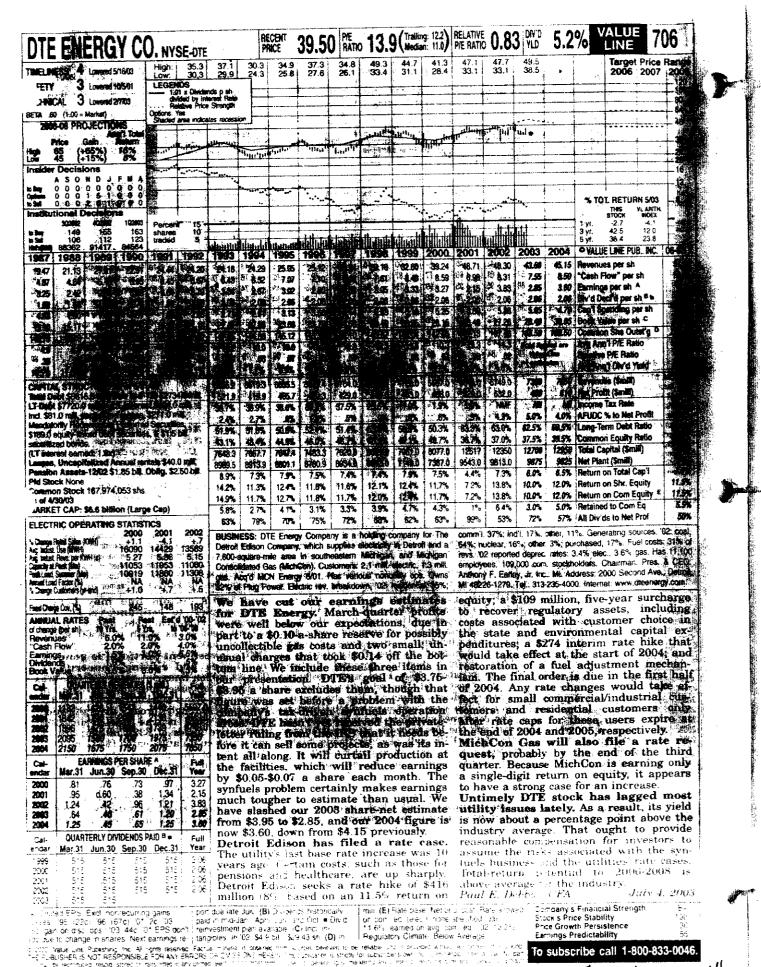


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Cinergy was formed on October 24, 19				- 	37.36	52.98	81.07	70.91	34.20	34.35			3
hrough the merger of Cincinnati Gas Electric and PSI Resources, Each commi		1 1	20.57 27.59 3.99 4.75	1 1	4.34	4.87	5.15	4.59	5.10	,		ow" per sh	1 6
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CAPITAL STRUCTURE as of 3/31/03	62% 75		5.6% 5.3%	5.2%	6.1%	6.6%	5.6%	5.4%	estin	di es	Avg Ann	'i Div'd Yield	4
Total Debt \$4623.5 mil. Due in 5 Yrs \$2374	5 1751,7 2924	2 3031.4	3242.7 4352.8	5876.3	5937.9	8422.0	12923	11962	6060	6180	Revenue	s (Smill)	- 6
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T Debt \$3977.0 mill. LT Interest \$209.0 mill.	31.7% 152		37.2% 34.5%		38.0%	38.4%	36.4%	30.2%	36.0%	36.0%	Income 1		36
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rfd Stock \$371.5 mili. Pfd Div'd \$24.7 mili.	41.3% 45.		48.6% 52.2%	48.5%	46.3%	48.2%	42.6%	42.5%	45.5%	47.5%	Commor	Equity Ratio	53
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it \$100 to \$108 a sh.; 303,544 shs. 4.16% 32% \$25 par. call. at \$25, \$308,2 mill. preferre		3 6251	6289.6 6297.	6344.5	6417.5	6630.4	8236.9	864€	8960	9140	Net Plan	t (Smill)	
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	11 6°a		3 3% 7.4%	1	12.400	4.2%	35 €	ð öe	12.0%	12.0%	1	n Shr. Equity	
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MARKET CAP: \$6.6 billion (Large Cap)	2.8 ^a _o ; 14W		2.8% 6.9%			4.1%	5.3%	34	4.0%			to Com Eq	
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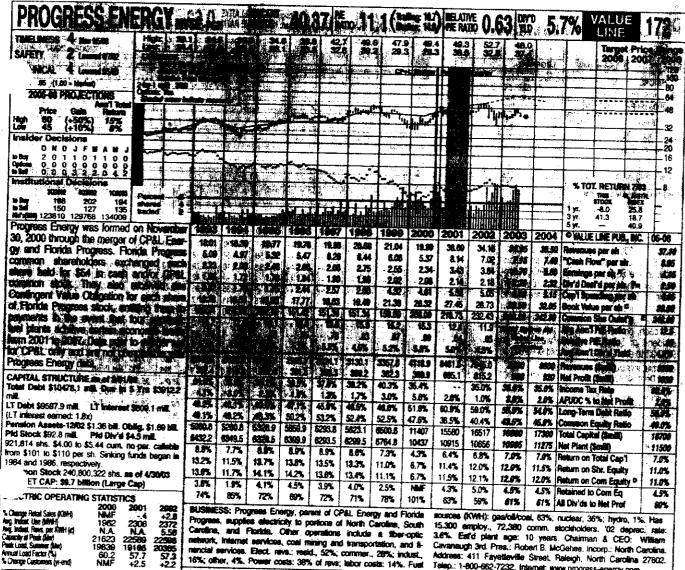


Item 16, page 14

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se electricity to portions of North Caroline, South Caroline, and Florida. Other operations include a fiber-optic metwork, internet services, cost mining and transportation, and 5nencial services. Elect. revs.; resid., 52%; commer., 28%; indust., 16%; other, 4%. Power costs: 38% of revs; lebor costs: 14%. Fuel

15.300 employ., 72,380 comm. stockholders. '02 deprec. rate: 3.6%. Est d plant age: 10 years. Chairman & CEO: William Cavanaugh 3rd, Pres.; Robert B. McGehee, Incorp.; North Carolina. Address: 411 Fayetteville Street, Raleigh, North Carolina 27602. Telep.: 1-800-662-7232. Internet: www.progress-energy.com.

Progress Energy's synthetic fuel tax Forest Change Cov. (%) 209 196 191 credits may be at risk. The Florida **ANNUAL RATES** Past Est'd 10-12 5 Yrs. to 10-16 9.5% AMP Progress subsidiary invests in four fuel of change (per sh) 10 Yrs. plants that combine a petroleum-based substance with coal waste to produce 6.5% 3.5% 3.5% 9.5% 4.0% 4.5% 3.0% "Cash Flow Earnings Drvidends NAME NAME NAME synthetic fuel. The sales qualify for federal tax credits, which were designed to reduce 6.5% U.S. dependence on imported oil by QUARTERLY REVENUES (\$ mill.) promoting alternative energy sources. The Mar.31 Jun.30 Sep.30 Dec.31 company expects to sell 12 million tons of 877.6 892.3 1084 1265 41189 this fuel in 2003. That would add \$0.75-908 2315 2330 1907 8461.5 7945.0 \$0.80 a share to corporate net. But the IRS recently announced that it would with-1050 2277 1922 2016 2013 2350 2021 draw the credits if the process used to con-2080 2390 2070 vert coal into synfuel fails to meet require-EARNINGS PER SHARE A ments. Management is confident that its Mar.31 Jun.30 Sep.30 Dec.31 conversion procedures comply with IRS standards, but it awaits an IRS field auditor's findings. The loss of tax credits 56 70 .56 .33 .83 1.53 .71 3,84 would have a serious adverse impact on ЯQ .57 17 PGN's prospects.

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The company is reducing investments in unproductive assets. It recently sold the North Carolina Natural Gas subsidiary for \$400 million. This enterprise never lived up to expectations, and PGN took a charge of \$20 million against the asset in 2002 Also up for sale is the affordable

housing investment, which generates modest earnings of \$0.02-\$0.05 a share yearly but does not fit in with corporate strategy. On the block in 2003 is the leasing opera-tion of the rail service business. The balance of this operation may be sold next year. Cash proceeds from these sales would be applied to debt reduction.

Earnings may decline this year. Positives include a full year of the April, 2002 acquisition of Westchester Natural Gas as well as higher wholesale sales, resulting from the output of new plants. But lower rates in Florida, additional shares outstanding, and higher pension costs will more than offset these pluses. Overall, we estimate a 4% reduction in 2003 earnings, to \$3.70 a share. An expected 2% gain in retail sales points to an earnings uptick next year. The stock is ranked 4 (below Average) for Timeliness.

Our earnings and dividend projections assume retention of synthetic fuel tax credits. But because of the uncertainty and the large amounts involved. investors might do well to stay on the eidelines until this matter is clarified.

Atthur $H.\ Medalie$ September 5, 2003

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Home	Stocks	Research Rep	orts Inv e stn	nent Ideas	Industries	Screening Cen	ter Markets	Fun
Quick Info Stock Overview Ouote	Ea	rnings E	stimates	5				
Chart Key Developments News	Į.	GEE E	sponsoi h	7411	RADES	in Earnings Estimates • EPS Estimates • Earnings Surprises		
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Quick Info Stock Overview		Earnings Est	timates	5						Si
Quote Chart Key Developments News		SO GO Advanced Search	sponso:	7	TRADI	ders	Earnings EPS Estin	mates	tes:	W
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Quick Info Stock Overview Quote	Earnings Estin	nates						Market Control	
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Press Releases	PROGRESS ENERGY,	INC. (NYSE)		_	Estimate	-		multiple m	arket
Company Profile	Sector: Utilities	Industry: Electric	: Utilities	t	Estimate	Trends		centers	
Financial Info Snapshot	• 7 Stocks to Buy Now!	•		å	🖺 Show a	il for print	ting	to seek	
Growth Ratios Financial Statements	9 \$7 Trades, open w/\$500							:	
Profile Report	Risk Alert : PROGRESS	ENERGY THE						:	
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	E	arnings Per S In US	hare Es Dollar	timates	3				
\$7 Trades, Open		# of Ests.	Mean Est.	High Est.	Low Est.	Std. Dev.	Proj- P/E		
an Account	Quarter Ending 12/03	10	0.76	0.81	0.70	0.03			
w/\$500	Quarter Ending 03/04	2	0.78	0.78	0.78	0.00	_		
Click here for info.	Year Ending 12/03	17	3.54	3.70	3.49	0.06	12.15		
iiio.	Year Ending 12/04	16	3.73	3.87	3.65	0.07	11.52		
	LT Growth Rate	10	3.65	5.00	1.00	1.25			
Find and Download Your Fund				•	Learn abo	out EPS Es	timates		
Prospectus Click here for	PGN Newspaper & Mag	jazines Archive	es					4.44.ED.(ED.	5.5
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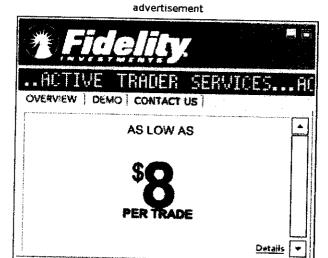
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EPS Estimates

How To Use The Earnings Estimates Report

Investors pore through vast amounts of information-raw data and ratios showing hitems relate to one another-to arrive at investment decisions. Virtually all of this information relates to events that have happened in the past in connection with the company and its stock. Yet you buy stock based on expectations you have regardin will occur in the future; specifically, how much profit the company will earn in the fithe investor's dilemma is that the one thing they truly need to know, future earning cannot be known at the time an investment decision is made. So investors study hid data to understand the dynamics that have affected the stock to date and to develope reasonable assumptions about the future.

Earnings Per Share Estimates Diluted EPS

	# of Ests.	Mean Est.	High Est.	Low Est.	Std. Dev.
Quarter Ending 06/99	12	0.38	0.38	0.37	0.01
Quarter Ending 09/99	12	0.38	0.40	0.37	0.01
Year Ending 12/99	23	1.41	1.45	1.39	0.02
Year Ending 12/00	16	1.58	1.61	1.52	0.02
LT Growth Rate	18	13.58	22.70	10.00	2.98

Multex collects the predictions made by professional stock analysts and presents th the Earnings Estimates Table. This table, updated daily, provides EPS estimates fro experts for the current and forthcoming quarters and for this year and the next. Fo context, the high, low, and mean estimates are shown, as well as the standard dev and the projected P/E ratio.

Related Information

Go back to EPS Estimates for CIN





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Item 16. page 30



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First Call Consensus Estimate Snapshot

CINERGY CORP. (CIN) Last 25-SEP-2003 **Industry:** Electric **Updated:**

Current Period Sept/2003 Q	Mean EPS 0.76	# of Brokers 6	Report Date 23-Oct-2003	Year Ago EPS 0.79
Dec/2003 FY	2.64	15	NA	2.68

P/E Ratio: 13.6

Consensus Recommendation: 2.6

Consensus Future 5-yr Growth Rate: 4.0%





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First Call Consensus Estimate Snapshot

DTE ENERGY CO (DTE)
Industry: Electric
Last
Updated: 25-SEP-2003

Current Period Sept/2003 Q	Mean EPS 0.90	# of Brokers 1	Report Date 28-Oct-2003 (week of)	Year Ago EPS 0.96
Dec/2003 FY	3.24	9	NA	3.83

P/E Ratio: 11.1

Consensus Recommendation: 2.9

Consensus Future 5-yr Growth Rate: 5.5%





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First Call Consensus Estimate Snapshot

FPL GROUP (FPL)
Industry: Electric
Last
Updated: 25-SEP-2003

Current Period	Mean EPS	# of Brokers	Report Date	Year Ago EPS
Sept/2003 Q	1.83	8	23-Oct-2003	1.79
Dec/2003 FY	4.88	19	NA	4.80

P/E Ratio: 12.6

Consensus Recommendation: 2.3 Consensus Future 5-yr Growth Rate: 5.0%

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SOUTHERN CO. (SO)
Industry: Electric
Last
Updated: 25-SEP-2003

Current Period Sept/2003 Q	Mean EPS 0.77	# of Brokers 8	Report Date 20-Oct-2003 (week of)	Year Ago EPS 0.84
Dec/2003 FY	1.85	20	NA	1.86

P/E Ratio: 15.5

Consensus Recommendation: 3.2 Consensus Future 5-yr Growth Rate: 5.0%

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CONSTELLATION ENERGY GROUP (CEG)

Industry: Electric

Last
Updated: 25-SEP-2003

Current Period Mean EPS # of Brokers Report Date Year Ago EPS Sept/2003 O 1.15 6 31-Oct-2003 1.07 (week of) Dec/2003 FY 2.75 14 NA 2.52

P/E Ratio: 13.0

Consensus Recommendation: 2.6

Consensus Future 5-yr Growth Rate: 6.0%

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First Call Consensus Estimate Snapshot

EMPIRE DISTRICT ELECTRIC CO. (EDE)

Industry: Electric

Last
Updated: 25-SEP-2003

Current Period Sept/2003 Q	Mean EPS 0.89	# of Brokers 3	Report Date 21-Oct-2003 (week of)	Year Ago EPS 0.82
Dec/2003 FY	1.47	4	NA	1.19

P/E Ratio: 14.9

Consensus Recommendation: 2.7

Consensus Future 5-yr Growth Rate: 3.0%



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For Ticker Symbol...

PNM

First Call Snapshot

60

First Call Consensus Estimate Snapshot

PNM RESOURCES INC (PNM)
Industry: Electric
Last
Updated: 25-SEP-2003

 Current Period Sept/2003 Q
 Mean EPS 0.65
 # of Brokers 1
 Report Date 29-Oct-2003 (week of)
 Year Ago EPS 0.59

 Dec/2003 FY
 1.97
 4
 NA
 1.81

P/E Ratio: 14.2

Consensus Recommendation: 3.0 Consensus Future 5-yr Growth Rate: 5.0%

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First Call Consensus Estimate Snapshot

PROGRESS ENERGY INC. (PGN)

Industry: Electric

Last Updated:

25-SEP-2003

 Current Period Sept/2003 Q
 Mean EPS 1.45
 # of Brokers 4
 Report Date 20-Oct-2003 (week of)
 Year Ago EPS 1.53

 Dec/2003 FY
 3.64
 16
 NA
 3.81

P/E Ratio: 12.1

Consensus Recommendation: 2.6

Consensus Future 5-yr Growth Rate: 4.0%

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Responses of the Attorney General's Witness
Carl G. K. Weaver to
Commonwealth of Kentucky PSC Case No. 2003-00334
And Case No. 2003-00335
Louisville Gas and Electric Company's and Kentucky Utilities Company's
Initial Requests for Information

17. Explain how the closing stock prices shown on Schedules 36 and 37 are "adjusted."

Answer:

The closing stock prices are adjusted for stock splits and stock dividends, so that it is a consistent series. For example suppose XYZ Company's stock had a 2 for 1 stock split effective June 15. On June 15 there would be twice as many shares outstanding. Assume that the prices on June 13, 14, 15, and 16 were \$30.50, \$30.80, \$15.60, and \$15.90 on those dates. The adjustment for June 13 would be \$30.50/2; for June 14 it would be \$30.80/2; on June 15 and 16 there would be no adjustment. The adjusted data series would be \$15.25, \$15.40, \$15.60, and \$15.90.

Responses of the Attorney General's Witness Carl G. K. Weaver to Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335 Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

18. In reference to Schedules 39-40, provide a computer disc showing all data and calculations underlying the calculation of internal rate of return. (All formulas should be reflected on this computer disc, including those for the calculation of the present value of the perpetuity and the calculation of the internal rate of return.)

Answer:

Enclosed is a computer disc showing the calculation for Schedule 39 and Schedule 40. The iterations for determining K were done by hand.

		1

Responses of the Attorney General's Witness Carl G. K. Weaver to Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335 Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

19. In reference to Schedule 43, provide the relevant pages from each source used in deriving the forecasts and projections in items 2-7 on that schedule.

Answer:

The requested source documents are attached.

.15 DAILY UPDATE: WEB RELEASE ONLY SELECTED INTEREST RATES	F	or immed Oct	iate rel ober 31,	ease 2003	
Yields in percent per annum					
110140	2003	2003	2003	2003	
	Oct	Oct	Oct	Oct	
	27	28	29	30	
Instruments					
Federal funds (effective) 1 2 3 Commercial paper 3 4 5 6	1.03	0.98	0.97	1.02	
Nonfinancial	1.02	1.02	1.03	1.02	
1-month	1.02	1.02	1.03	1.02	
2-month	1.09	1.08	1.05	1.05	
3-month					
Financial 1-month	1.03	1.03	1.03	1.03	
2-month	1.05	1.03	1.04	1.04	
3-month	1.06	1.07	1.06	1.07	
CDs (secondary market) 3 7	1 05	1.06	1.06	1.06	
1-month	$\frac{1.05}{1.10}$	1.11	1.10	1.10	
3-month	1.15	1.17	1.14	1.15	
6-month	1.10	_ ·			
Eurodollar deposits (London) 3 8	1.05	1.05	1.04	1.05	
1-month 3-month	1.09	1.10	1.10	1.10	
6-month	1.14	1.15	1.13	1.15	
Bank nrime loan 2 3 9	4.00	4.00	4.00 2.00	4.00 2.00	
Discount window primary credit 2 10	2.00	2.00	2.00	2.00	
u c government securities					
Treasury bills (secondary market) 3 4	0.93	0.96	0.96	0.95	
4-week	0.96	0.94	0.94	0.94	
3-month	1.03	1.01	1.02	1.02	
6-month Treasury constant maturities ll					
1-month	0.95	0.98	0.98	0.97	
3-month	0.98	0.96	0.96	0.96 1.04	
6-month	1.05	1.03	1.04 1.29	1.32	
1-year	1.31	1.25 1.71	1.79	1.86	
2-year	1.83 2.35	2.23	2.32	2.39	
3-year	3.21	3.11	3.20	3.29	
5-year	3.75	3.67	3.76	3.83	ند
7-year	4.30	4.23	4.31	4.36	_
10-year 20-year	5.19	5.14	5.21	5.25	
Treasury long-term average		e: 10	5.25	5.28	
(25 years and above) 12 13	5.23	5.19	5.25	3.20	
Interest rate swaps 14	1.48	1.50	1.44	1.49	
1-year	2.15	2.22	2.10	2.21	
2-year	2.75	2.81	2.70	2.82	
3-year	3.22	3.27	3.17	3.32	
4-year 5-year	3.60	3.65	3.56	3.72	
7-year	4.16	4.19	4.12	4.27 4.79	
10-year	4.68	4.70	4.66 5.42	5.52	
30-year	5.42	5.43	J.74	J.J <u>.</u>	
Corporate bonds					
Moody's seasoned	5.68	5.63	5.70	5.74	
Aaa 15	6.69		6.70	6.72	
Baa State & local bonds 16				4.88	
Conventional mortgages 17					

The Budget and Economic Outlook: An Update

August 2003 --Section 7 of 8

Table C-1.



APPENDIX

CBO's Economic Projections for 2003 Through 2013

 Υ ear-by-year economic projections for 2003 through 2013 are shown in the accompanying tables (by calendar year in Table C-1 and by fiscal year in Table C-2). The Congressional Budget Office did not try to explicitly incorporate cyclical recessions and recoveries into its projections for years after 2004. Instead, the projected values shown here for 2005 through 2013 reflect CBO's assessment of average values for that period--which take into account potential ups and downs in the business cycle.

CBO's Year-by-Year Forecast and Projections for Calendar Years 2003 Through 2013

		Fore	cast				P	rojecte	d				
	Actual 2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Nominal GDP (Billions of dollars)	10,446	10,836	11,406	12,025	12,706	13,391	14,098	14,823	15,559	16,312	17,105	17,943	
Nominal GDP (Percentage change)	3.6	3.7	5.3	5.4	5.7	5.4	5.3	5.1	5.0	4.8	4.9	4.9	
Real GDP (Percentage change)	2.4	2.2	3.8	3.5	3.3	3.2	3.0	2.9	2.7	2.6	2.6	2.6	
GDP Price Index (Percentage change)	1.1	1.5	1.4	1.8	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	•
Consumer Price Index ^a (Percentage change)	16	2.3	1.9	2 4	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Employment Cost Index ^b (Percentage change)	3.3	3.0	3.2	3.2	3.2	3.3	3.4	3.4	3 4	3.4	3.4	3.4	
Unemployment Rate (Percent)	5.8	6.2	6.2	5.7	5.4	5.3	5.2	5.2	5.2	5.2	5.2	5 2	
Three-Month Treasury Bill Rate (Percent)	1.6	1.0	1.7	3.2	4.0	4.7	4.9	4.9	4.9	4.9	4.9	4.9	
Ten-Year Treasury Note Rate (Percent)	4.6	4.0	4 6	5.5	5.8	5.8	5.8	5.8	5 8	5.8	5.8	5.8	
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http://www.cbo.gov/showdoc.cfm?index=4493&sequence=6

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Table 4. ECONOMIC ASSUMPTIONS ¹ (Calendar years; dollar amounts in billions)

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	Actual	2003	2004	2005	2006	2007	2008
Gross Domestic Product (GDP):	ernap interestable variety is papara	perio de menos de menos de la como de la como de la como de la como de la como de la como de la como de la como	, erentementatione ander elect	\$P\$ 化中国联络 医上皮层 医乳体炎 医血清性病	aria, 4 de se esta Principa de Contrario de La como de		
Levels, dollar amounts in billions:							
Current dollars	10,446	10,863	11,405	11,972	12,563	13,183	13,837
Real, chained (1996) dollars	9,440	9,661	10,018	10,378	10,733	11,079	11,427
Chained price index (1996 = 100),	110.7	112.4	113.8	115.3	117.0	119.0	121.0
annual average							
Percent change, fourth quarter over							
ourth quarter:				_			4.0
Current dollars	4.3	4.4	5.1	4.9	4.9	5.0	4.9
Real, chained (1996) dollars	2.9	2.8	3.7	3.5	3.3	3.2	3.1
Chained price index (1996 = 100)	1.3	1.5	1.3	1.4	1.6	1.7	1.8
Percent change, year over year:							5 0
Current dollars	3.6	4.0	5.0	5.0	4.9	4.9	5.0
Real, chained (1996) dollars	2.4	2.3	3.7	3.6	3.4	3.2	3.1
Chained price index (1996 = 100)	1.1	1.6	1.2	1.3	1.5	1.7	1.8
incomes, billions of current dollars:							4 454
Corporate profits before tax	665	708	671	1,151	1,142	1,135	1,154
Wages and salaries	5,004	5,162	5,438	5,740	6,060	6,373	6,689
Other taxable income ²	2,411	2,479	2,615	2,662	2,706	2,767	2,851
Consumer Price Index (all urban): ³							
Level (1982-84 = 100), annual	179.9	184.0	187.0	190.4	194.2	198.6	203.1
average						0.0	2.2
Percent change, fourth quarter over	2.2	1.9	1.8	1.9	2.1	2.3	2.3
fourth quarter			4 ****	4.0	2.0	2.2	2.3
Percent change, year over year	1.6	2.3	1.7	1.8	2.0	4.2	د.ي
Unemployment rate, civilian, percent:					5 0	E 4	5.1
Fourth quarter level	5.9						
Annual average	5.8	5.9	5.6	5.4	5.2	5.1	5.1
Federal pay raises, January, percent:							***
Military ⁴	6.9	4.7	4	NA	NA	NA	
	4.6	4.1	5	NA.	NA	NA	NA
Civilian ⁵ Interest rates, percent:							
_	1.6	1.2	2.0	2.8	3.6	4.2	4.3
91-day Treasury bills ⁶ 10-year Treasury notes	4.6				4.8	5.1	5.3

The economic assumptions for the Mid-Session Review, summarized in Table 4, differ from those used in the Administration's 2004 Budget in that they incorporate the fiscal, monetary, and economic developments discussed above.

During the second half of this year and into 2004 and 2005 growth is now projected to be somewhat stronger than anticipated in the February Budget, while inflation and interest rates are now projected to be lower. The unemployment rate is slightly higher in the near term, reflecting the higher current level.

Item 19, page 4

Value Line Forecast for the U.S. Economy

			ACTUAL				ES	TIMATEL	ס	
Account to the second s					3002	2003	2004	2005	2006	2007
THE PARTY OF THE PROPERTY OF THE PARTY OF TH	1998	1999	2000	2001	2002	2003	200-	2003	2000	200.
ROSS DOMESTIC PRODUCT AND ITS COMPONENTS										
996 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS	8432	8794	9121	9258	9424	9650	9996	10345	10708	11082
nal Sales	5684	5965	6224	6377	6576	6760	7037	7269	7516	7779
otal Consumption	1136	1228	1324	1255	1183	1202	1297	1414	1534	1657
onresidential Fixed Investment		259	276	271	226	213	219	241	260	278
Construction	262 875	976	1056	988	971	1009	1098	1197	1304	1409
Equipment & Software			372	374	388	409	412	416	425	437
esidential Fixed Investment	345	368		1076	1059	1063	1144	1269	1393	1506
xports	1002	1036	1137	1492	1547	1609	1725	1851	1962	2070
nports	1224	1357	1536	571	613	656	678	691	700	711
ederal Government	525	538	544			1100	1101	1118	1143	1163
tate & Local Governments	958	1002	1037	1069	1100	1100	1101		7145	,,,,,
iross Domestic Product	8782	9274	9825	10082	10446	10855	11425	12083	12801	13573
eal GDP (1996 Chain Weighted \$)	8509	8859	9191	9215	9440	9661	10020	10390	10785	11195
Sal CDr (1996 Chain Weighter 4)	****									
RICES AND WAGES-ANNUAL RATES OF CHANGE						4.5	1.9	2.0	2.1	2.2
GDP Deflator	1.2	1.4	2.1	2.4	1.1	1.6		2.1	2.3	2.5
PI-All Urban Consumers	1.5	2.2	3.4	2.8	1.6	1.9	2.0		2.3 1.8	2.0
PI-Finished Goods	-0.9	1.8	3.7	2.0	-1.3	2.4	1.2	1.5		3.2
mployment Cost Index—Total Comp.	3.5	3.2	4.6	4.1	3.8	3.8	3.2	3.1	3.2	3.£ 2.5
roductivity	2.6	2.4	2.9	1.1	4.8	3.5	2.6	2.5	2.5	2.3
RODUCTION AND OTHER KEY MEASURES	6.5	4.9	5.0	-4.1	-1.1	1.4	5.8	6.0	4.0	3.0
ndustrial Prod. (% Change)			81.4	75.6	73.7	73.5	76.5	78.0	79.0	80.0
actory Operating Rate (%)	81.9	81.4		-63.2	4.1	13.0	54.8	60.0	55.0	50.0
Nonfarm Inven. Chg. (1996 Chain Weighted \$)	75.0	64.2	67.2			1.77	1.65	1.65	1.67	1.70
Housing Starts (Mill. Units)	1.62	1.65	1.57	1.60	1.71 16.8	16.4	17.0	17.5	17.7	17.8
Fotal Light Vehicle Sales (Mill. Units)	15.5	16.9	17.4	17.1			7.8	7.9	8.0	8.0
Unit Car Sales (Mill, Units)	8.1	8.7	8.9	8.4	8.1	7.6 6.1	6.0	5.7	5.6	5.5
National Unemployment Rate (%)	4.5	4.2	4.0	4.8	5.8		-400.0	-400.0	-300.0	-225.0
ederal Budget Surplus (Unified, FY, \$Bill)	69.2	124.4	236.9	127.3	-157.8	-380.0	25.00	25.00	24.00	24.00
Price of Oil (\$Bbl., U.S. Refiners' Cost)	12.58	17.42	28.21	22.95	24.00	28.00	25.00	23.00	24.00	24.00
MONEY AND INTEREST RATES										_
3-Month Treasury Bill Rate (%)	4.8	4.6	5.8	3.4	1.6	1.1	1.5	2.0	2.3	2.5
Federal Funds Rate (%)	5.4	5.0	6.2	3.9	1.7	1.1	1.4	2.0	2.5	3.0
	5.3	5.6	6.0	5.0	4.6	4.0	4.6	5.2	5.3	5.5
10-Year Treasury Note Rate (%)	5.6	5.9	5.9	5.5	5.4	5.1	5.6	6.0	6.2	6.3
30-Year Treasury Bond Rate (%)	6.5	7.0	7.6	7.1	6.5	5.9	6.3	6.5	6.6	6.8
AAA Corporate Bond Rale (%) Prime Rate (%)	8.4	8.0	9.2	6.9	4,7	4.1	4.4	5.0	5.5	6.0
\$ 1110 CONTROL \$ 177										
INCOMES	7.0	4.9	8.0	3.3	2.8	4.3	5.3	5.2	5.3	5.5
Personal Income (% Change)	7.0		4.8	1.8	4.3	4.6	3.8	2.5	2.7	3.0
Real Disp. Inc. (% Change)	5.4	2.6	2.8	2.3	3.7	4.1	4.5	3.5	3.5	3.0
Personal Savings Rate (%)	4.8	2.6			665.0	748.0	829.0	929.0	1022.0	1103.0
Pretax Corporate Profits (\$Bill)	721.1	762.0	782.0	670.0		495.0	547.0	613.0	674.0	728.0
Aftertax Corporate Profits (\$8ill)	482.3	514.0	523.0	471.0		495.U 9.5	10.5	12.0	10.0	8.0
Yr-to-Yr % Change	-13.1	6.6	1.7	-10.0	-4 .0	9.3	10.3	12.0	10.0	\$.0
COMPOSITION OF REAL GDP-ANNUAL RATES OF CHAP	IGE									
Gross Domestic Product	4.3	4.1	3.8	0.3	2.4	2.3 2.4	3.7	3.7	3.8	3.8
Final Sales	4.2	4.3	3.7	1.5	18	2.4	3.6	3.5	3.5	3.5
	4.8	4.9	4.3	2.5	3.1	2.8	4.1	3.3	3.4	3.5
Total Consumption	12.5	8.1	7.8	-5.2		1.6	7.9	9.0	8.5	8.0
Total Consumption Nonresidential Fixed Investment			6.5	-1.7	-16.4	-5. 9	2.7	10.0	8.0	7.0
Nonresidential Fixed Investment	6.8	-1.3						9.0	9.0	8.0
Nonresidential Fixed Investment Construction	6.8 14.6	-1.3 11.5		-F: 4	-1.7	3.9	8.8	3.0	0.0	
Nonresidential Fixed Investment Construction Equipment & Software	14.6	11.5	- 8.2	-6.4 0.3		3.9 5.4	Q.8	1.0	2.0	3.0
Nonresidential Fixed Investment Construction Equipment & Software Residential Fixed Investment	14.6 8.0	11.5 6.8	- 8.2 1.1	0.3	3 4	5.4			2.0	
Nonresidential Fixed Investment Construction Equipment & Software Residential Fixed Investment Exports	14.6 8.0 2.1	11.5 6.8 3.4	- 8.2 1.1 9.7	0.3 -5.4	3 G -1 F	5.4 0.4	0.8	1.0	2.0 9.8	3.0
Nonresidential Fixed Investment Construction Equipment & Software Residential Fixed Investment	14.6 8.0	11.5 6.8	- 8.2 1.1	0.3	3 4 -1 6 3 7	5.4	0.8 7.6	1.0 10.9	2.0 9.8 6.0	3. <i>0</i> 8.1

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Itam 19. page 5



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Gail Fosler Chief Economist

Global Growth

- Recovery is under way, with a likely 18-24 month life span
- Emerging markets will outpace advanced economies—but financial risks persist
- · Latin America still lags rest of emerging markets
- Costs and capacity control are job number one for global business—still!

StraightTalk is a monthly publication from the Chief Economist of The Conference Board. provides economic research, objective analysis, and forecasts to help new economy busing executives assess economic conditions impacting their markets. <u>Download a sample issue (293 KB)</u>

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Indicators

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The U.S. Economic Forecast* October 2003

	2003			2004			2002	2003	2004
	II Q*	III Q	IV Q	ΙQ	II Q	III Q	ANNUAL	ANNUAL	ANNUAL
Real GDP	3.3	4.8	5.1	5.2	3.7	4.0	2.4	2.7	4.4
CPI Inflation	0.6	2.2	1.9	2.0	2.0	2.5	1.6	2.3	2.0
Real Consumer Spending	3.8	6.6	3.6	4.6	3.7	3.5	3.1	3.2	4.2
Unemployment Rate (%)	6.2	6.3	6.2	6.1	6.0	6.0	5.8	6.1	6.0
90 Day T-Bills (%)	1.04	0.88	0.83	0.98	1.23	1.48	1.61	0.98	1.42
10 Yr Treas Bonds (%)	3.62	4.35	4.35	4.60	5.00	5.00	4.61	4.06	4.98

^{***} Current \$ Level With IVA & CCA

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^{*}Seasonally adjusted, annual rates except where noted. Source: The Conference Board

I/B/E/S: EARNINGS	ESTIMAT	ES				
<u> </u>		EPS EST'S-		# OF	CHG IN	MEAN(\$):
PERIOD-	MEAN	HIGH	LOW	ESTS	1MONTH	ЗМОМТН
		3.64	3.05	9	-0.17	-0.56
(0.4	2 (2	1 12	3 20	1.0	-0.13	-0.20
∩TB 09/03	0.90	0.90	0.90	7	3.00	
QTR 12/03	1.20	1.20	1.20	1	0.00	0.20
EA	RNINGS P	ER SHARE	ANNUAL	GROW:	TH KATES	3 -6.2%
LAST 5 YEARS	4.2%	FY03/02	-15.	4 8	QTR 09/0	3 -0.20 3 0.20
LAST 5 YEARS NEXT 5 YEARS	5.2%	FY04/03	11.	8%	QTR 12/0	3 -0.0%
משר משר באורם	cv			EST	D F/Y EPS	:
DTE DTE ENER INDUSTRY CODE	.G.1 ET.ECTT	, р	RTCE	12/	03 12/0	4 YIELD
INDUSTRY CODE ELECTRICAL UT	TITTES	. 3	4.75	3.	24 3.6	2 5.9%
ELECTRICAL OF	TULLITIO	J				
FY12/02 EPS:	3.83	DIVIDEND:		2.06	YIELD:	5.9%
	10 7	n/n net d	CD.	0.50	P/E REL	IND: U.O.
FY12/03 P/E: FY12/04 P/E:	9.6	P/E REL S	&P:	0.52	P/E REL	IND: 0.76
1112,011,-						
		FCST EPS	GRWTH-		REI	TATIAF
					DTE	
	D'	re ini) 5	00	TO INI	TO S&P
FY03 VS FY02	-15	.48 3.69	16.	1%	-432	-96
FY04 VS FY03	11	.8% 5.1%	12.	.6%	231	93
NEXT 5 YEARS	5	$.28 ext{ } 5.19$	12.	25	101	
LAST 5 YEARS	4	.2% 6.3	9.	.78	82	34
	1.0	.7 13.2	21	Δ	81	50
P/E FY 2002		.6 12.7	18.	4	76	
P/E FY 2003	9	.6 12.7	10			
DIS'	TRIBUTIO	N OF EPS	ESTS. A	AS OF	08/29/03	
	DTE.	EPS FY	12/02	\$ 1	3.83	
FY 12/0	3 - 9 E	STS		FY 13	2/04 - 10	ESTS
MEAN F.	PS \$ 3.	24		MEA	N EPS \$	3.62
timin n	,					

Zacks Con	ipaniy ito			Industry:	UTIL-ELEC PWR		. , , , , , , ,		Blend
Rec Price		Mkt Cap	Div Rate	Yield	Sales (12Mo)	SIs Gr			Zacks Rank
\$36.31	13.3	\$6445 MM	\$1.84	5.1%	\$6725 MM	5%	5%	0%	Hold

10/31/03

Cinergy Corp. is one of the nation's leading diversified energy companies. Cinergy owns or operates electrical and heat plant generators that are either operational or under development domestically and internationally. It also has electric and gas transmission lines in the U.S. and abroad. Cinergy Solutions focuses on cogeneration, energy services and utility outsourcing for large industrials, municipalities, universities and other large energy consumers. Its customers include BP Amoco, Kodak and General Motors. (Company Press Release)

Ave Broker F	Rec	#Up	#Dn	Price/Vol	lume Dat	9		EPS,P/L	E and G			£ "	r/Yr
HOLD		0	2	52-Wk Hi	gh	\$38		FY		EPS	P/E		'S Gr
	· · · · · · · · · · · · · · · · · · ·				Low	\$29	.36	12/02 A	ct	2.68	12.0	-	3%
	Broker			PriceCho	3-YTD	8%		12/03 E	st	2.61	13.	_	3%
Recom	mend	ations			D(Rei)	-10	%	12/04 E	st	2.76	13.3		%
				Avg Dly		710	000s	Last 5	(r			5	%
	TT-			Exp Retu				Next 3-	5Yr (Es	t)		4	%
				Impl Ret=		9%		Other k				5	-Yea
				Beta		-0.0	14			Curre		A	vg
				Deta				P/E (12	Mo)	13.3		1	2.4
2 2				Shareho	ider Data	,		Rel P/E	-	56%			
		0 .	1	Shares (.5 MM	Net Ma		7%		5	.4%
STR BUY	HOLD	SELL	STR	Institutio			68%	ROE	· 9····	13.2%	, n		4.3%
BUY	HOLD		SELL	4	HIS	1.9		LT Deb	t/Can	53%	•		3%
				Insiders		1.5	U 70	L. Den	UOAP	0070			
EPS (\$)	FY End	Data		,	Quarter Er	nd Data	:	Projection	ons	FY End l	Data	PRK	
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TIL-ELEC PW		T		Comparabl	20		• • • •	Impl		•			
III.ECEC PAN	Α.	Pr Chg	-	EPS Gr		Price/	Price/	Ret/	Div	Net	ŀ		Deb
	402		(12Mo)		Book	Sales	CF	P/E	Yield	Marg		ROE	Car
	193	YTD		4%	1.8	1.0	7.0	0.67		6.99		13%	53%
INERGY COR		8%	13.3			1.0				6.29		11%	JJ /
IDUSTRY AVO	j-		13.6	5% 7%	1.4 5.2		6.0	0.63	1.6%			17%	
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&P 500		19%	23.9	<u>/ /º</u> dustry grou					1.0/0				

(1.6 * 1.07) + 7

Zacks Investment Research

Item 19, page 8

THE Investment Survey

Part 1
Summary
&
Index

File at the front of the Ratings & Reports binder. Last week's Summary & Index should be removed.

October 10, 2003

TABLE	OF SUMMA	RY & INDEX C	ONTENTS	Summary & Inde Page Number
Industries, in alphabetical order Stocks, in alphabetical order Noteworthy Rank Changes				1
Stocks, in alphabetical order		····		2-23
Noteworthy Rank Changes				
Industries, in order of Timeliness Rank Timely Stocks in Timely Industries Timely Stocks (1 & 2 for Performance) Conservative Stocks (1 & 2 for Safety) Highest Dividend Yielding Stocks Stocks with Highest 3- to 5-year Price Biggest "Free Flow" Cash Generators Best Performing Stocks last 13 Weeks Worst Performing Stocks last 13 Week Widest Discounts from Book Value	25-24 27-25 30-3 Potential 33	Stocks with H Stocks with H Stocks with H Stocks with H High Returns Bargain Base Untimely Stoc Highest Divid	owest P/Es lighest P/Es lighest Annual Total lighest 3- to 5-year Earned on:Total Ca ment Stocks ks (5 for Performan end Yielding Non-ut th Stocks	35 Returns 36 Dividend Yield 36 Apital 37 Ace) 38 ility Stocks 38

The Median of Estimated - PRICE-EARNINGS RATIOS of all stocks with earnings

17.8

26 Weeks Market Low Market High Ago 9-21-01 4-16-02 15.2 15.4 20.9 The Median of Estimated
DIVIDEND YIELDS
(next 12 months) of all dividend
paying stocks under review

1.9%

26 Weeks Market Low Market High Ago 9*21-01 4-16-02 2.2% 2.2% 1.6% The Estimated Median Price

APPRECIATION POTENTIAL

of all 1700 stocks in the hypothesized economic environment 3 to 5 years hence

50%

26 Weeks Market Low Market High Ago 9-21-01 4-16-02 105% 55%

ANALYSES OF INDUSTRIES IN ALPHABETICAL ORDER WITH PAGE NUMBER Numeral in parenthesis after the industries rapid to probable performance (next 12 months)

🦿 Numeral in parentne	sis after the industry is refreshe bit bibbe	Die bellondence lier is inchaler
PAGE		September Sept
Advertising (67)		the late of the second of the
Aerospace/Detense (59)		
Air Transport (39)		The state of the s
Appens (63)	ENTRA LINE AND AND AND AND AND AND AND AND AND AND	
Muto & Truck (37)	Performance and the second sec	
Auto Parts (31)	Electronics (34)	
Back (47) 2101	Entertainment Maria Section 1997	
Bank:(Canadian) (64): non-millioni 1579	Extendiament and applications are a second and a second a	
Bank (Midwest) (65)	Environmental (20) (24 annual of the control of the	Man and The Common Property of Spiritual Property (1967) Inch Property (1967)
Beverage (Alcoholic) (60)	Financial Svcs. (Div.) (35)	300 Semiconductor Equip (32) . 1012, 1001
Beverage (Soft Drink) (51) 1545	Food Processing (81)	(34) (34)
	Food Wholesalers (24)	rib.) (86)458 Steel (General) (96) 576
*Building Materials (76)851	Foreign Electronics (66)) (65) 437 Steel (Integrated) (97) 1414
Cable TV (17)	Foreign Telecom, (7)	1970 Jelecom. Equipment (9)
Canadian Energy (72)428	*Furn/Home Furnishings (94) 595 Chaice Equip Sup	Dies (35) 1135 1916com. Segycos (34)
*Cement & Aggregates (43) 888	Grocery (62)1517 - Capado Sycare qu	1910 Telecom Equipment (9) 745 plies (36) 1136 Telecom Sepices (30) 745 p. (83) 1944 Textile (46) 1665
Chemical (Basic) (93)	Healthcare improperation (1975) was the second of the seco	Total (81) Tot
Chemical (Diversified) (89) 1966	Home Appliance (32)	GUCE (MI) Comment (MI) (198 & HUBBER (79) Comment (MI)
Chemical (Specialty) (82)477	*Homebuilding (1) 867 Petroleum (Integ	rated (57)
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Communicaci/Decisionalis (200) 1166	#Laurahada Debahada (783 UAT) 1200/00/04/15/00/04	GE PA PRE INTENDICATION 2000
Diversified Co. (75)	nousinal services (A+	The Transfer of the American American Commence of the Commence
Drug (18)1246	Information Services (8) 389 Precision Justiful	erii (46) 124 1890 *Reviewed in this week's issue
E-Commerce (12)1434	Insurance (Life) (36)	*Reviewed in this week's issue.

In three parts: This is Part 1, the Summary 4 1110s. Part 2 to Published weekly by VALUE LINE PUBLISHING, INC. 22 and 2012 Seed, New York, NY: 10017-5891

2000s. Verse two Publishment and State International Finance International State International State International State International State International State International Internati

Responses of the Attorney General's Witness Carl G. K. Weaver to

Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335

Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

- 20. In reference to Schedules 44-49.
- a. Provide a computer disc with all data and calculational formulas underlying these schedules.
- b. Explain why Dr. Weaver ended the analysis in 2001, rather than going through 2002.
- c. Explain why Dr. Weaver used only nine holding periods, while in past testimonies he has used ten.
- d. Is it Dr. Weaver's opinion that investors would give the same weight to a return achieved, for example, between 1994-1995 compared with a return achieved in 2000-2001? Explain the response.
- e. Provide a copy of the Standard and Poor's *Stock Reports* dated November 30, 2002 for each company.
- f. Provide a copy of the most recent Standard & Poor's Stock Reports for each company.
- g. Provide a copy of the source from which the yields on Treasury securities were taken.

Answer:

- a. enclosed
- b. See testimony, page 43, line 22 through page 44, line 9.
- c. The "Business Cycle Dating Committee" of the National Bureau of Economic Research "determined that a trough in business activity occurred in the U.S. economy in November 2001. The trough marks the end of the recession than began in March 2001 and the beginning of an expansion" (NBER Report released July 2003). 1992 marked the beginning of an expansion that ran to the recession that began in March 2001. This period represents a complete business cycle. If 1992 had been included, a complete cycle plus a year containing an expansion would be represented. The data would be biased upward.
- d. No. Stock market performance is a leading economic indicator. Investors react to their expectations rather than historical results. This a major reason why a complete business should be included in historical data analysis. The period 1994-1995 represents a period of economic expansion that would have been anticipated prior to it occurring. Likewise, the period 2000-2001 ended with a March 2001 through November 2001 recession. Investor expectations would perhaps foreseen both events but the amount of lead time in foreseeing the expansion and recession may differ causing the two period to be incomparable.

- e. Attached.
- f. Attached.
- g. Attached

Itam 20, page 7

STOCK REPORTS SPOOR'S

06-SEP-03 Sub-Industry:

Cinergy Corp.

NYSE Symbol CIN

Business Bummary - 13-AUG-03

Bummary: CIN is the holding company for Circannati Gas & Electric Co. and PSI Indiana, Ohio and Kentucky.

AM LAR ON DIT HANDE WIND TO BUT THE WAY AS ON DIT HAND TO BOTH THE WAY AS ON DIT HAND TO BOTH THE WAY AS ON DIT HAND TO BE THE WAY A Yield = 5.2%. Earnings vs. Previous Year 12: Mo. P/E = 13.5 Auth Vulbum Burke Orse 14 10 Week Mov. Avg. 30 Week Mov. Avg. Relative Strength Price As Of 8/05/03 + 35.26 \$2 Wk Range + 38.75-28.25 S&P Opinior: Hold: **! STATE AND ADDRESS OF THE PARTY CHAPT MAN 199/2 souls hely athritizative setunitions SemiliDiv. Renk echnical Eval.

Fiscal Year Ending Dec. 31 Key Stock Statistics
8AP EPS Est. 2003
PPE on SAP Est. 2004
SAP EPS Est. 2004
Dividend Reseashare
She. outsing. (M)
Avg. daily, vol. (M) After an ambidiopated decelve of about 1% in 2009 (from 2002) and objecting EPS of 12009 (from 2002) as a constraint of 2004 (from 2002) as a constraint of 2004 (from 2002) as a constraint of 2004 (from 2002) as a constraint operations are stated to perform better emings should remain restricted by the stread of the week according of 101% large base of 5th other agreements. In 2002, operating EPS (which excludes 50.55 in one-time changes) was dituted by 6.5 million additions are streaments. In 2002, operating EPS (which excludes Any agreements, they passe CAAE's residential raise through the stream and according to the constraint of 1014 agreements. They are considered the transfer of 1014 agreements and other transfers of streaments and other transfers on the constraint of the constraint of 1014 agreed to customers) and other transfers ones of the stream of 1014 agreed to customers) and other transfers ones of 1014 agreed to customers) and other transfers ones of 1014 agreed to traves, over 1014 and 114 an

Value of \$10,000 trivested that years 413,171

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Tong, Blk. Velue/Sh Beta Shareholders Market cap. (B) Inst. holdings

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We'fisher falsed our opinion on Chergy stock to hold from weld. With the shares having declined from their recent high. In stock is now trading at P/E multiples of our EPS esti-

Dividend Data (Dividends have been paid aince 1853.) Next earnings report expected; late Octobe Obd that are in line with the company's Freeze. With the caches in the share in that we carefully the share in that we carefully to be a secure did.

Well (whe divident payour mitto (at 69's, the above the industry average, it is above the industry average, it is above the industry average. It is confront level. The divident was in
Sign Signatury 2009 paymant, and with the shares of the amount industries are and with the shares trading at a multiple of ES SIS Out ESS settimate for 2003.

at be considered a selphinish to buy, or and any security, hearing Sup not any other pany can found to be prohibited with the selberg particularity. September of the particular selberg selbe 2 4 4 5 5 2 2 3 5 5 2 2 3 8 Jan. 14 Jan. 22 14 San. 23 52 mi fegulatory information, go to www.standar I accurately reflect the research analysis person from only response or inclinately, related to the special onconverse.

STOCK REPORTS

Clnergy Corp.

Cutergy Corp. Is a holding company serving about 1.5 million We electric customers and 500,000 gas customers in a 25,000 square mile area of Otho, Indiana and Kentucky, it was formed through the 1994 mindan and Kentucky, it was formed through the 1994 mindan and Kentucky, it was formed through the 1994 mindan and Kentucky, it was formed through the 1994 mindan and Kentucky, it was formed to revenues by business segment in 2002 were electric, 75 fb% (83.3% in 2001); gas, 41.1% (35.3%), pro in its order approving the merger, the SEC reserved jurisdiction over the company's ownership of Cincinnati das & Electric the order three years. CIN was required to state how its restertion of the three years. CIN was required to state how its restertion of the three years. CIN was required to state how its restertion of the Utifity Modify Company and relevant standards of the Public training and the SEC its rationale of how its selection of the SEC approved Cincing's releation of the pre-frAsE reas excensions.

Code gas operations.
Conchruet Gas & Electric (CG&E) and its subaidishes supply electricity and natural gas in the southwestern portion of Chio end adjacent areas in Kentucky and Adlana. The primary subaidishy of PSI Resources (formerly PSI Holdings) is PSI Energy (formerly Public Service Company of Indiana), which is the largest electric utility in Indiana, serving a population of

CGAE and PSt purchase about 28 million tons of coal annu-ally, around adds, through long-term contracts, and the rest

Iltrongly the spot market or short term supply agreements.
The coal is primarily received from mines located in Indiana, West Virginia, Onlo, Kentucky, Pennsylvania and libraria.
Consolidated construction and other capital expenditures for 2002 were \$988 million. For the period from 2003 though \$200, cit N has projected explaid and hivestment appropried \$3.86 billion. The forecast includes capital expenditures (each market at approximately \$640 million) required to comply with proposed nitrogen oxide (NO) limits.

In July 1999, CIN social to 50% imprest in Miclands Electric in July 1999, CIN social to 50% imprest in Miclands Electric Company serving more than 2 million customers in England, to 650 to about \$700 million.

06-SEP-03

ion. Including CIN's share of liabilities assumed by GPU, transaction was valued at \$1.55 billion. CIN restined Mellands. London-based gas trading operations. It also maintained its U.K.-based CINergy Global power Services, with was involved in the development of international energy he company's other principal subsidiaries include Cinery Wholessie Energy, the holding company for Chreegy Power Generation Services, which provides electric production-related construction, operation and maintananton service.

				İ								
		Por Share Data (6)					ļ					
		(Yesr Ended Dec. 31)	2002	500	9008	<u>=</u>	3	1997	3	3	3	1
		Tengible Bk. Vel.	19,14	18.02	17.54	18.80	18.04	2				
9.6	8	Eamings	25.	77.0	5			3 6	20	10.17	15,40	17.10
	900	S&P Core Esminas	;		3	3	8	2.40	80.7	2	2	q
	55.637	Dividende		7	ž	ž	ž	Ž	ž	≨	ž	2
	3	on the contract of	8	8	8	8	1.80	1.80	1 74	22	1 30	
			%	%99 9	72%	7%	100%	2	76	Ì	è	3
	*	Prose - High	37.19	35.60	35.35	34.97	20 02	Ş		2	2	2
			25.40	20.00	8	8		200	Q (7 .	27.75	8
12 171		P/E Retio - High	4	5	3	3	9	3	00.74	23 31	8	23.87
ŝ		. Low	? =	9 5	<u> </u>	•	4	- :	1,	‡	ā	₹
				1	1		*	*	7	=	9	Ž
986	90	Income Statement Analysis (Million \$)										
		Revs.	285	12.024	8 423	A 0.20	2003	1				
		Dept.	414	0,0		5	0/0/0	Q.	3,243	3,031	2,924	7,7
504	333	Main	: 2	9	4/5	ģ	Š	588	283	580	ž	3
1 275	1 072	Fyd Chos Cou	<u> </u>	Š	ę	800	192	176	<u>\$</u>	182	202	٤
782	920	County Outlier	8	90	3.82	8. 8.	530	3.13	3.43	233	2	5
	9 6		Ž	ž	ž	ž	ž	7.41	7.41	0	9 0	3
2 5	7		% 98.5%	36.7%	36.7%	8	31.0%	37 0%	30.5%	94.00		3
8	8 8 8 8	Net Inc.	387	442	399	\$	8	26.35	938	8 1		Ę
		Sale Core Earnings	360	8	2	4	2	3 :	3	Š	5	Ď,
8							٤	٤	ž	ž	ž	ž
3.5	9 9	SAMPING STREET & Other Fin. Data (Mills	S S									
7	9	Gross Prop.	13,816	13.083	2	10.877	90.00	100	7000	100		
4		Oap, Exp.	857	2	200	980	2	- C	D (819,6	900	5,266
3 3	3	Agi Prop	0.00	3	9 6	9 :	Ř	5	83	325	9	6
3	=	Caottatization:	Š	103,0	9	6.41/	9	6,14	8,290	6,251	6,180	3.786
		LT Date		000								
		Man Man	,	D :	S A	300	8	2,166	2,536	2,531	2.715	1.820
		1	0	/	513	3	48.7	7	47.7	46.3	\$	9
			Ē	Z	₹	Z	95.0	174	1	3		į
6		, in the second	Ž	Ē	Ī	Ž	2	9		;		1
A	3	COMPRISO	8,90 3	#, 9 42	2,789	2.654	2.54	2 130	7	9		
1	i	a Common	\$ 2.5	42.6	6.	3	8.8	2	48.8	4		5
	I	local Calo	9,217	9,206	6,914	5,736	984.99	8.283	8.638	,	?	?
•	1	N Oper, Retto	833	7.78	8	9 10	8					R
Š	2	A Earn, on Net Prop.	ď	104				7	2	9	3	A.181.8
£	ş	A Betara On Neva		3	7	3	N.	9	0.0	T	7.	6.3
¥	203	S Return On Invest Canda	1	1	•	0	*	9	10.3	£.	8	Ī
F 14	5	A Return On Com. Faulty			.	11,7	9	-	9.0	8	4	69
	3	,	16.7	10.4	14.7	Ö.	10.3	14.2	13.0	14.0	24	3

Bark, Chokinati Office—198 East Fourb St., Chokinati, OH 48202, Tel—(613) 421-9600, Webside—Into/Inversion conditions of the St. Chokinati, Sept.—18, Chokinati, Sept.—18, Chokinati, Sept.—18, Chokinati, Sept.—18, Chokinati, Sept.—18, Chokinati, Sept.—18, Chokinati, Sept.—18, Chokinati, Sept.—18, Chokinati, Sept.—18, Chokinati, Sept.—18, Chokinati, Ch

date act, for all. dive. Bold denotes chiused EPS (FASB 128)-prior peri

STANDARD

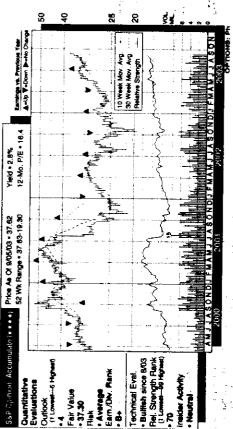
Constellation Energy Group

& POOR'S

STOCK REPORTS

06-SEP-03

Bab-Industry: Bummary: This holding company owns energy-related businesses, including a Mult-Utilities & Unregu- North American wholessie power marketing and merchant generation business, lated Power and Baltimore Gas and Electric Co.



Overview - 08-AUG-03

Accounting rule changes will force CEG to record certain contracts on a gross basis beginning in 2008 (increasing reported prevenues and operating expense by equal arrounted with the for revenues and operating expense to increase more feath of the relativistic properties of the relativistic properties of the relativistic properties of the relativistic properties of and arroritzation change. However, we expect a more than 15% increase in net interest, in our extinstion, potenting earth of the ported freezes, his our extinstion, properting earth of the ported EPS in 2002 reflected on accounting changes. He ported EPS in 2002 reflected one coccurring changes. He may the EPS in 2002 reflected one coccurring changes. He may the EPS in 2002 reflected one coccurring changes. He may the EPS in 2002 reflected one coccurring changes are settinged. We estimate asset to be compared to the changes are settinged as the 2003 standard & Poor's Core Eermings of the 2003 standard & Poor's Core Eermings.

Value of \$10,000 invested five years ago; \$ 14,395

Tang. Bk. Vakue/Shere Belg.

2.84 Ting Bi. VakarShi 13.2 Bata 3.10 Shareholders 1.04 Marker cap. (8) 165.9 Iret. holdings. 0.644

Kery Stock Statestics
84P EPS Est. 2003
PR on Sap Est. 2004
Sap EPS Est. 2004
Olividand Resultsian
Sin. curing, (M)
Ang. delity vol. (M)

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2000

Flacel Year Ending Dec. 31

Dividend Data (Dividends have been paid since 1910.)

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Stock of Record

Next semings report expected; late October

all of the views expressed in this research report accurately reflect the research analysis personal views regarding any and all of the subject securities or issuers. No part of analysis compensation was, is, or will be directly or indirectly related to the specific recommendations or views expressed in this research report For important regulatory information, go to www standardandpoors.com, "Regulatory Disclosures," Jan. 24 Apr. 25 Jul. 25 The region's for information purposes and should not be consistented a soferlation to hits or sail seatherises regionable tracement in the loss of Bethants sport or problemes effects entran between

Business Summary - 06-AUG-03 STOCK REPORTS SINIBARD In S&P 500 NYSE Symbol CEG

in recent periods, Constellation Energy Group has made streed to sequisitions from distressed energy merchants and utilities while divesting non-core operations. In September 2002, Constellation Energy acquired NewTenergy, a competitive energy acquired NewTenergy, a competitive energy supplier for large commercial and industrial customers, from AES Corp. for \$250 million in cash. In December 2002, to denergy management cash. In December 2002, to denergy management and consulting businesses from Aleghery, Energy for \$21.2 million, in the first quarter of 2003, CEG also amounted the acquisition of 125 megawats of 2003, CEG also amounted the acquisition of 125 megawats of 2003, CEG also amounted the acquisition of 125 megawats of 2003, CEG also amounted the acquisition of 125 megawats of 2003, CEG as amounted the acquisition of 125 megawats of 2003, EG and 300 MW of energy contracts from Note Tenergy businesses and control for 87%, and Other Normagulated Electric Utility operations 8%, (10%, in \$001, 87%, in 2000); Reputated Cash Utility operations 8%, (10%, in \$001, 87%, in 2003); Reputated Cash Utility operations 8%, (10%, in \$001, 87%, in 2003); Reputated Cash Utility operations 8%, (10%, in \$001, 87%, in 2003); Reputated Cash Utility operations 8%, (10%, in \$001, 87%, in 2003); Pepulated Oser Utility operations 8%, (10%, in \$001, 87%, in 2003); Pepulated Oser Utility operations 8%, (10%, in \$001, 87%, in 2003); Pepulated Oser Utility operations 8%, (10%, in \$001, 87%, in 2003); Pepulated Oser Utility operations 8%, (10%, in \$001, 87%, in 2003); Packer 10%, in an energy contract origination and risk management services, and retail an energy soprated by services, with the April 2003 of completion of a new 830 MW Calitorial power plant, in a service and retail anergy supply services.

Constellation Energy Group, Inc. and Constellation Energy

3.5

ation capacity. During 2002, 88.1% of Energy Merchants generation output was derived from nuclear and open fined power.

In from conducted by NewEnergy and other businesses.

Requised utility operations are performed by Baltimore data, and decided utility operations are performed by Baltimore data, and 809,000 gas customers at the end of 2002, BGE's residential electric rates have been fixed firtugal uply 2008 in seldential electric rates have been fixed firtugal uply 2008 in seldential electric rates have been fixed firtugal uply 2008 in seldential electric rates have been fixed firtugal uply 2008 in proders get to share in gas und cost sawings BGE realizes for distribution customers and concess for commercial and indistribution system).

Other Norsequised businesses include Energy Products and Savides for commercial and indistributions, residential HVAC (healing, ventiliation and sit-conditioning) and competing services for Baltimore commercial quantities. In contrast 2008, the company scele for instruction and competing services in shares of Orion Power to Reliant Resources for SES mill.

In In March, CEG sould its interests in Colporate Office Properties Trust through a public offening, rationing \$101.3 million, Additional 2002 divestitures included a South Anerican generates of land holdings.

ů,

•	Per Share Deta (5)								-		
	(Year Ended Dec. 31)	2002	200	2000	<u>6</u>	<u>\$</u>	1991	986	200	100	1
	Tenolitie Bk. Val.	2	77 5%	20.00	50.00	9	10.44	90.00		٩	
		į		3 6	2			R	0.0	¥	
	Control of the Contro	3 :	3	8	2	8	7.7	8	202	8	-
ľ		1.75	5	ž	₹	ž	₹ Z	ž	≨	≨	Ž
7	Chrosena	8.0	0.48	88.	£	2	2	5.	S.	1.51	7
0.27	Payout Ratio	8	ž	Š	ķ	81×	×98	498	É	É	٤
7	Prices - High	32.38	50.14	52.08	31.50	35.25	34.3	29,80	20.00	28 80	7
3	*61-	19.30	20.90	27.06	24.68	28.25	24.75	25.00	22 00	20.80	8
8	PAE. Rutto - High	₽	8	S	7	4	8	16	7	2	=
	- Low	9	9	12	11	14	7	, =	Æ	; =	. 22
	insome Statement Analysis (Million	on \$}									
	Reval	4.703	9 828	3.879	9.787	8.96	9.00	8.468	0.004	0.00	
į	Dept	4	419	470	8	377	Š	330	3	Ž	
ı	Weint	ž	ž	∢ Z	8	178	170	174	89	166	Ä
;	Fird, Chae, Cov.	2.50	3.01	3. 12	8	2.81	2.62	3.60	200	2	92
ê	Conett. Oradita	ž	ž	∢ Z	ž	6	900	10.0	8.	20.00	8
e :	ETT. The Faile	37.1%	31.6%	40.03	36.0%	35.2%	36.8%	8	33.4%	25.24	30.03
9	Ned Inc.	228	4.2	945	338	328	283	311	8	Ř	3
4007	SaP Core Eamings	290	54.9	Ν¥	ž	ž	Ź	Z	≱	≨	2
3	Balance Sheet & Other Fin. Data ((Million \$)						1. 41		J. 17.	: T
2	Gross Prop.	12,354	11,862	10.442	8,989	8.744	8.495	8.18	7 979	4	1,1
8		820	1,318	1,079	8	8	373	8	35	8	4
8		7,957	7,700	6,644	5,523	5,867	5,652	5,582	4	4417	4
3		,		!					h		3 : 5
2.08		3	2,803	9.0	2,766	3,128	2.989	2.750	2	2.00	282
		4.66	43.0	51.5	9	5.0	48.5	46.3	8.8	4.0	Ç
		₹:	₹ :	Ξ.	\(\frac{1}{2}\)	8	23.0	3	51	***	Š
	e e	Ž	ž	ž	Z	Ž	4.87	29.90	8	9	2
	Common	3,862	3,844	3,153	2,883	2,982	2,870	2,857	2,813	2,718	262
	A CONTINON	2	57.0	48.5	25.0	49.9	46.6	0.84	47.5	46.9	43.
	odel Cap.	10,083	8.271	7,943	7,157	7,727	7,432	7.261	7.	7,097	Ž
ı	% Oper, Ratio	87.2	78.3	84.3	87.8	82.5	75.4	2	8	22.7	8
5	% Eam. on Net Prop.	17.8	5.0	13.3	13.6	13.1	11.9	12	12.7	6	d
3 §	A Return On Revs.	11.2	2.7	6.9	9.6	8.6	89	6.6	1.5	1.0	11.0
2 .		60	10.5	8.2	7.8	11.0	8.6	9	9.6	7.2	7.2
•	A Hetum On Com. Equity	13.6	6. 23	-	10.0	10.5	69	96	10.8	40.0	Š

932.3 970.5 3.785

966.0 961.6 1,036

1,147 943.2 1,036 901.8 3,928

1.270 1.372 1.372

33535

2 2

Date as ong repid (for Bakimore G&E pr. to 4/30/98); bet results of dec operatispec, items. Per share data adj, for sit, dive. Bold denotee divuted EPS (FASB 128)-prior periods restated E-Estimated. NA-hot Available. NM-hot Meaningful, NR-hot Hanked.

Apr. 01 '03 Jul. 01 '03 Oct. 01 '03

Dec. 10 Mar. 10 Jun. 10 Sep. 10

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Office—756 E. Preff Street, Baltimore, MD 21202. Tel—(4 til) 234-5001 Website—http://www.contelletonenergy.com.Chrmn, Pres & CEO—M. A. Shathuck III.
SVP & CFO—E. F. Smith. VP & Seey—K. A. Chagnon. Investor Contact—Jeck Thayer (410-783-3647) Dite—Y. C. Barnani, D. I. Backer, J. T. Brack, F. R.
Thenster Agent & Rogette—Co. 4 other. Continented Stock Transfer and Trail Co. New York Interpretable—in Mandrah in 1806. Bracker. Analysis.

Analysis. Characteristics of the Continented Stock Transfer and Trail Co. New York Interpretable—in Mandrah in 1806. Bracker. Analysis.

STANDARD & POOR'S

DTE Energy

STOCK REPORTS

2 a 2

Sub-Industry: Electric Utilities 06-SEP-03

un Summary: This energy holding company for Detroit Edison acquired De-troit-based MCN Energy Group, the holding company for Michigan Consolidated Gas, in 2001.

않 H CATANATA A CONDICTION OF THE WAY A SOUD OF TAXON OF THE WAY A SOUD OF THE WAY A SOUND OF THE WAY 10 Week Mov. Avg. 30 Week Mov. Avg. Retains Birength Yisid • 5.8% 12-Mo. P/E • 9.7 Price As Of 9/05/03 - 35.45 62 Wk Range • 49.50-34 Part Strength Renk W with me on POTATION EVEL Quantitative Evaluations 18 rtook

Key Stock Statistics
9AP EPS Est. 2003
PAR on SAP Est. 2004
Divident Resulting
Property (H)
Myo, delly you (M)

3.85 Tang. Bit. Value Str. 16.9 Bank. - 15.0

We specified shiftings for shulfs to decline about 8% in 2003. Sale East 2003. Sale Time Bu-was provided to the following the shiftings for shulfs and the following the f

9 5 4 2 7

Diff. to the uncertainty surrounding the pending review by the 20 th 50 th 20

Dividend Data (Dividends have been paid since

Dec. 19 Mar. 20 Jun. 19 Sep. 18

Nov. 28 Jun. 03 Sep. 05

1906

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Next earnings report expected: NA

24888

2.02.03 2.03.03

rilles or issuery. No part of see its accuracy or males ation, go to www.standardandpoors.com, "Regulatory Disclosures." [34] I the research analyst's personal views regarding tany and all of the subject each ted to the specific recommendations or views expressed in this research report. De considered a solicitation is buy or self any security. Agitizer S&P nor any valors is prohibited without welfiles permission. Caparight © 2005

والمواز أوال المائه يهدان

DTE Energy Company

STOCK REPORTS

NYSE Symbol DTE

In S&P 500

Business Summary - 18-JUN-03

DTE Energy, formed on January 1, 1996, is the holding company for Detroit Edison Co., the largest electric utility in Michigan, serving 2.1 million customers in the southeastern part of the state.

On May 31, 2001, the company borghary for Michigan personal consolidated Gas Co. (MichiCon). The transaction, under a February 2001 revision of an October 1999 agreement, was for cash (55%) and stock (45%) valued at \$2.24 billion (service) and stock (45%) valued at \$2.24 billion (service) to cash (55%) and stock (45%) valued at \$2.24 billion (service) to cash (55%) and stock (45%) valued at \$2.24 billion (service) to cash (55%) and stock (45%) valued at \$2.24 billion (service) to cash (55%) and stock (45%) or destriction of an October 1998, and stock (45%) and 52.84 service electric and gas businesses accounted for 80.7% of operating revenues in 2002 (80.6% in 1898) and 72.8% of operating use in 2002 (80.6% in 1898).

income (28,4%).
The company's non-regulated businesses include DTE Engray Trading Company, which is involved in the trading and marketing of electricity, gas and coal: Energy Services, which consists of businesses that develop and manage energy-related assets and services such as coke and synthes production, independent power plants, on-site powerhouses

and cogeneration facilities, coal services and landilli gas re-covery, and DTE Energy Technologies, which markets distrib-tied generation products and monitors and manages system operations.

06-SEP-03

DTE's other non-regulated businesses include operations so quived in the merger with MCN Energy; the gas and of exploration and production business, and the gas pipelines and proceeding business. The company's consolidated capital spending in 2002 totaled \$984 million, down 10.2% from \$1.096 billion in 2001 capital expanditures.

In December 1998, the Michigan Public Service Commission (MPSC) authorized accelerated amortization of the Fermi 2 Nuclear assess, providing for complete recovery of assess by December 31, 2007.

In June 2000, Michigan excelled egislation establishing Janwary 1, 2002, as the date for full implementation of the MPSC a program providing for full customer choice of electricities by 8 st, and provided Detroit Edison with the right to recover stranded coets.

In January 2002, transmission assets owned by Derrolt defant were transferred to wholly owned ITC. In December 2002, DTE agreed to sell ITC for about \$610 million; the sales was completed February 28, 2003.

	Per Share Data (5)										
	(Year Ended Dec. 31)	2002	2001	2000	<u>=</u>	<u>5</u>	484	2	200	=	
		14.81	16.06	28.15	98	25.49	24 55	23.41	8	28	2.0
14.61		3.83	2.14	3.27	3.33	3.05	2 88	2 13	080	2 67	
900	SALP Core Enmings	2.80	2.09	ž	ž	ž	ž	ž	Ź	Ž	5 2
109,443		2.06	80.	2 08	208	500	208	508	8	, e	2 2
0 •		3,45	Š	₹88	Š	5	Ŕ	Š	ž	ì	
*	•	47.70	47.18	4	1	49.26	7	8	2	8	2
	The property of the	33.05	33	28.43	8	8	8	2	\$ %	3 X	9 6
	10 10 10 10 10 10 10 10 10 10 10 10 10 1	-41	***		-	101		4			
	- 100	٠	\$	•	•	÷		5	i a	•	~
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	PROVED TO A STATE OF THE PROPERTY OF THE PROPE	67.40	9.440	E 507	4 706		0 704				
	Daor	92		2000		į	7	3	3695	3.519	3,565
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150	First Chee, Con.	8	5	5	2	E 2	2 8	2	9	2	ā
	Goratte Condition	3	3	Y .	3	3	2	2	324	ĕ	3.15
6.01	Tal Pass	§ 3	5 3	Ž	£ {	2	2	9	2	2	8
4.201	Met Inc.		•	,			1	•	*	ž	2
	8&P Core Eaminos	3			3	1	=	Š	\$	4	3
	ı	- 1		٤	2	ž	Į	≱	≱	≱	Ź
2 2	DAMENCE SCHOOL & COURT FIR. Deta (Million	(Millon S)		j							
4	Gross Prop.	17,862	17,0007	13,162	12,746	12,178	14.406	13.777	13.304	12.046	19 717
ā	C-0.	3	80 (740	2	3	3	3	4	1	3
2	Net Prop. 10th st.	9,813	9,643	7,367	7.148	6.943	8	5	6.510	3	
1	Calphanization: , where			•		-					
		7.788	7,926	4,082	4,062	* 35	3,014	2000	3.756	3.951	3.972
	- 1000 I	030	8	803	9	3	51.3	1.7	90.0	3	9
	3	₹ :	Ž	Ē.	2	₹	<u> </u>	7	327	8	8
		₹ ;	Ž	Ē	₹	Z	96	8	4.30	8	5.00
VIDENT	Committee	286	4,867	4.015	3,900	3,696	3.562	3.44	3,436	3826	2
į	a Continue	37.0	37.0	, 48.7	4 9.1	48,	46.7	46.0	45.7	1	3
	IONE CARO.	13.434	1,00	9,678	988	608'6	908	9,822	8,902	10,019	8
16 703	% Oper. Retto	82.8	98	66.3	B2.2	61.4	90.2	ě	787	98	78.3
30.00	A EATH ON NAT Prop.	*	8.2	+	12.8	11.8	8.4	42	9.6	6	6
Apr. 15 US	A return On Hevs.	4.0	4 6	4.0	10.2	10.5	=	8.55	-	-	14.7
23	A Netter On Invest. Capital	- -	8 .0	-	6.9	6.2	6.0	8.2	7.4	Ź	G
200	A HABITAL OF COM. EQUITY	138		41.	157	50	9	4	4	: :	;

Ver, Detroit, Mi 48226-1270. Tel—(313) 236-4000. Webside—http://www.deenergy.co. V.P. & 8692-7. B. M. Bees, Preventer Cherolle—breet, 1-print (513-526-6300), Dires—T. I. V.P. E. H. Hormssey, T. S. Lapponott, d. B. Lochta, E. A. Miller, C. W. Pyez-K., H. F. Say, H. M. H. Work tri. 1903, reincorporated in Machigan in 1907, Ellingh—11,065, Sale Anal

Item 20, page

STANDARD &POOR'S

STOCK REPORTS

Sub-Industry: Electric Utilities 06-SEP-03

Summary: EDE provides electric service to parts of Missouri, Kansas, Oklahome and Arkansas, and also provides water service to three towns in Missouri.

Empire District Electric

NYSE Symbol EDE

The Empire District Electric Company

Business Summary - 10-MAR-03 STOUK REPORTS

Earnings vs. Previous Veer ▲=Up ▼=Down ▶=No Cha

Yield • 6.0% 12-Mo. P/E • 15.2

52 Wk Range • 22.20-15.06

Outlook (1 Lowest—5 Highs

Tair Value

Quantitative Evaluations

10 Week Mov. Avg 30 Week Mov. Avg Helstive Strength

Empire District Electric (EDE) generates, purchases, transmitta, distributee and selle electricity in parts of Missouri, Kansas, Cklahorna and Arlanasas. The company also provides water service to three frowns in Missouri, in 2001, neady and gross operating devenues came from electricity sales, with EDE's service territory consists of approximately 10,000 square miles and a population of more than 360,000, primarily inhoughout eauthwestern Missouri and annalise parts of southeastern Kansas, northeastern Chalanas, morthasatern Chalanos and northwest earth Arkanasa in 2001, 88% of total retail electric revenues meet reprovided 6%, 3% and 3% of total electric revenues meet respectively. In 2001, 42% of EDE's operating revenues and the respectively. The company supplies electric services a traisil for 19 incorr. In prefered communities, to ventous unincorporated areas, and at the windereale to frous municipally owned distribution systems and at the windered communities, to ventous unincorporated areas, and at the windered communities, to ventous unincorporated areas, and at the windered communities, to ventous unincorporated areas, and at the windered communities, to ventous unincorporated areas, and at the windered communities, to ventous unincorporated areas, and its from the form rederification systems and at the windered communities, to ventous unincorporated areas, and at the windered communities, to ventous unincorporated areas, and at the windered communities, to ventous unincorporated areas, and at the temperation of any 157,000. EDE, operates under franchises with nonginal terms.

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of 20 years or longer in virtually all of the incorporated communities. About 51% of electric operating revenues in 2001 carnel from incorporated communities with franchises having a least 10 years remaining, and about 18% were from incorporated communities in which franchises have remaining lerms of 10 years of less.

06-SEP-03

Based on kilowatt hours generated, coal was used to supply 70% of lotal fuel requirements. Natural gas supplied 29%, with old generation providing least than 1%. EDE supplied 29%, with old generation providing least than 1%. EDE supplied 29%, with old generation providing least than 1%. EDE supplied 29%, with old generation providing least than 1%. EDE supplied 29%, thin spential of pany projects that construction appending will PISE to \$72.2 million in 2003. The maximum hourly demand on the company's system as reached a record high of 1,001 megawatts on August 50.00. EDE and an new maximum hourly winter of mand of 841 megawatts on December 19, 2000. In May 1999, EDE agreed to be acquired by LiftiCorp Linited, inc., a Knarasa City, Mo-based electric and gas utility, of the approximately \$900 million, including \$550 million in adoct and cash and the assumption of \$500 million in oder. In January and 2001, thilloop terminated the agreement, citing lack of

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Kay Stock Statistics

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effect the research analysis parsonal vaeve regarding any and all of the aubject exputities or issuers. No part of released to the specific recommençations or views expressed in this research report. ndpens cent, "Regulatery Dacksurge," All of the view expressed in the necessary report accurately reflect the research analysis plantscrial views regarding any and all of selegic emperation was, it, or will be indeed you further threated the special concernentations or views accreased in the little sport is for information purposes and other consideration to the order of the properties of alternation was an order of a

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Dividend Data (Dividends have been paid since: (944.)

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STANDARD 8.POOR'S 06-SEP-03 Sub-Industry: Electric Utilities

STOCK REPORTS

FPL Group

NYSE Symbol FPL

STOCK REPORTS In S&P 500

4.0 million customer secondral in an eras escendral profession customer secondral in an eras secondral profession as a season as a season as secondral part of the state. The utility's electric revenues by customer cleas in 2002 were: residential, 55% (55% in 2001, 55% in 2001) commercial, 35% (53%, 56%, in 2001, 55% in 2002) commercial, 35% (53%, 56%, in 2001, 55% in 2003) commercial, 35% (53%, 56%, in 2001, 55% in 2003) commercial secondary commercial secondary in 2003, 55%; in 2005, 20%; in 2005, 20 PPL Group is the holding company for Florida Power & L. Company and FPL Group Capital.
Poride Power & Light Company provides electricity to at Businese Summary - 28-AUG-03 Summery: Through its Florida Power & Light subsidiary, FPL serves more than 4,000,000 customer accounts; through FPL Energy, it produces electricity from clean and renewable fuels. 8. 2 Vield - 3, 8% 18-Mb. P/B - 16,8 A-Us V-Dom F-Ho Dea

Price As Of 9/05/05 - 61.84 62 Wk Pange - 66.07-48.86

Author.

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10 Week Mov. Avg. 30 Week Mov. Avg. Relative Strength

SE-SEP-CS As of December 31, 2002, FPL Energy had on FPL Group, Inc.

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Main Prop. 14,304 11,862 9,934 9,264 8,555 9,354 9,384 9,862 9,354 9,384		C. E.C.	1,277	446,	1,299	198	617	651	488	671	8	75
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Year Ending Dec. 31

Tang. Sk. Value/Shere Beta

Key Stock Statistics

Bharaholdara Market cap. (B) Inst. holdinge

BAP EPS Est. 2003 PE on BAP Est. 2003 BAP EPS Bet. 2004 Dividend Rate/Bhare She. cump. (M) Avg. delly vol. (M)

After an anticipated 2% increase in 2003 (from 2002's operating EPS of 84.80), we expect an approximate 4% increase in 2004. While a strong first quanter was somewhat officer to a

Overview - 28-AUG-03

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Data as ong repid; bet results of diec operatispec frems. Per share data bdi for sik divs. Bold denotes ditured EPS (FASB 126) Efetimeted NA-Noi Aveisable, NM-Not Mesenlogful, NR-Not Ranked, UR-Under Review.

For important regulatory information, go to www standardandprons com, Regulatory Disclosures,"
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Other—700 Universe Bird., Juno Beach, Ft. 33408. Tel.—(561) 664-4000, Widestell-High/inniv pl.con Chrime.

Commun. Sery—O. P. Copie Investment Centeur. And Russon (161-684-4607) (Dir——4.4 Junual, 8. B. Barrello, M. Dorner, 8. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello, M. Dorner, 9. Barrello

We have lowered our opinion on FPL shares to hold from securated. With only modes earnings growth expected for 20 below the inclusing sverage, we believe the ahares are fairly to waked at around 12X our EFPs satimate for 2004, which is in Vivialed at around 12X our EFPs satimate for 2004, which is in Vivialed at around 12X our EFPs satimate for 2004, which is in Vivialed at around 12X our EFPs settimate for 2004, which is in Vivialed at around 12X our EFPs settimate for 2004, which is in Vivial the earn roughly in line over the next 12 months. FPL increased its dividend by 3.4% with the March 2003 payment.

With the company of kindend payout ratio of 50% well below. Am the industry average, we expect to see similar annual investigation in the years to come oriented investors would, in our view, the more attracted to attract investors would, in our with the current multithe to our EPPs entities of the uniter in Pullich and Pull annual and plant investors would, in our the current multithe on our 2003 earning as the march multithe on our 2003 earning as we have a fine of the current multithe on our 2003 earning as we have a page

Fig. 86 of 44.80), we expect an approximate 4% promesses in Fig. 88 of 44.80), we expect an approximate 4% promesses in Fig. 88 of 64.80), we expect an approximate 4% promesses in Fig. 88 of 64.80), we expect an approximate 4% promesses in Fig. 88 of 64.80), we expect an approximate of 64.80 of 64.8 Itum 20,

52232

Dividend Data (Dividends have been paid since 1944.)

Stock of

Ex-Dy.

å

Nov 29 Feb 28 Jun. 06 Aug. 29

Nov 26 Feb 24 Jun. 04 Aug 27

feb 14 May. 23 Aug. 15

0.600 SX.

he current multiple on our 2003 estimate, we have a 12-month target price of \$66.

Next earnings report expected: mid October

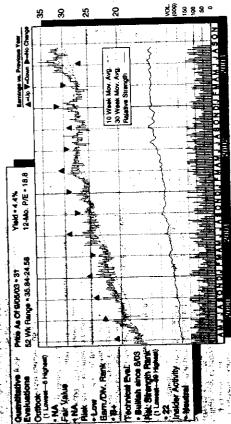
Business Summary - 10-JUL-03

STOCK REPORTS

MGE Energy, Inc.

STOCK REPORTS

Summary: The principal subaldiary of this public utility holding company is Madison das & Electric, which generales and distributes electricity and distributes electricity and distributes negatively and distributes are uniformally and distributes. **Sub-Industry:** Electric Utilities 06-SEP-03



Business Profile - 10-JUL-03

Value of \$19,000 transmed five safety gapor \$ 18,224

Key Stock Statistics Dividend Rate/Share

She, outstp. (M) Avg. delby vol. (M) Tang. Bk: Value/Bhare.

Ending Dec. 31

F - 10-UL-03

Dividend Data (Dividends have been paid alone 1909.)

Next semings report expected: serfy No

2 2 2 2 2 4 4 6 2 5 5 5

that said it expects its electric and gas sales to increase 1% to 2% annually through the end of 2007. MGEE also articles to 2% annually through the end of 2007. MGEE also articles as peak demand growth of approximately 3% through the 2007. The company forecasts that its service territory will remain well insulated against economic downtums. MGEE believes tavorable distribution costs, a low percental actions and lower risk of being unable to recover that customers, and lower risk of being unable to recover the customers. The and lower risk of being unable to recover and lower risk of being unable to recover and lower risk of being unable to recover an exercise in a deregulated electric industry.

Madeon Gae & Electric generates, transmits and distributes electricity to nearly 130,000 customers throughout a 250 sequen mile stars of Dane County, in addition, the company transports and distributes natural gas to more than 125,000 customers across 1,375 aquare miles of service territory in

In 2002, residential and commercial electric services revenues accounted for 36% and 46% of total selectric revenues. 18—agactively. The emainder of 2002 electric revenues were derived from industrial sales. 9%, sales to public authorities including the University of Wisconsin, 7%; and sales to other

utilities and other 3%. Electric operations computed 65% of the company a 2002 operating revenues.

Residential and commercial customers computed 65% of the company a 2002 operating revenues.

Residential and commercial customers contributed 56% and 37% of used 2002 gas revenues accounted for 36% of the company a operation accounted for 36% of total 2002 gas revenues.

MGEE owns a 2.2% interest in the Columbia Energy Center.

Columbia, with two 512 megawatt units, uses coal from Myoming and Montana coal fields.

The company and the University of Wisconsin (UM) are contributed to work on a proposal to build a natural gas-fired cognineration plant, expected to cost \$180 million. The plant organization plant, expected to cost \$180 million. The plant will help to meet the future needs of UW and MGEE customing the company and gas-yeaded to come on line in 2005, in December 2001, MGEE purchased the Prainie du The company adold its 17.6% ownership interest in the Rewardnes North will self accompany adold its 17.6% ownership interest in the Rewardnes North WPSC upon closing that consisted of come of Kewardnes a book value (\$8.9 million) plus the book value of Kewardnes a book value (\$8.9 million) plus the book value of

(Tigest annoted beet, at) (19 et) (1	160 160 160 160 160 160 160 160 160 160	23.67 2.68 2.367 2.68 2.367 2.68 2.367 2.68 2.68 2.68 2.68 2.68 2.68 2.68 2.68	28.7 2.3.7 2.0.8 2.0.0.8 2.0.0.8 2.0.0.8 2.0.0.8 2.0.8 2.0.8 2.0.8 2.0.8 2.0.8 2.0.8 2.0.8 2.0.8 2.0.8 2.0.0 2.0.8 2.0.0 2.0.0 2.0.0 2.0.0 2.0.0 2.0.0 2.0.0 2.0.0 2.0.0 2.0.0	- 4 × 8	10 0 84 0 84 0	<u>‡</u> 4₹8	. 2 <u>2</u> ≥	= -
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734 79% 79% 70.14 24.56 16 16 16 17 17 17 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18			26.25 27.55 27.55 28.05 27.55 28.05 27.55 28.05 27.55		1.27		Ŗ	X
24.58 24.58 16 16 16 18 28.4 28.4 28.4 28.4 28.5 28.5 28.5 28.4 28.5 28.5 28.5 28.5 28.5 28.5 28.5 28.5	"		23.75 1.71 1.71 250 290 290	8	₹	85%	Š	* =
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* Common					908	Ĩ	ž	
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SEERT, ON Net Prop.					2.5	9.6	401	2
N. Tarbin On Revs.	() Q)	. :			4.9	9	3	•
A Hatury On Invest. Capital	<u>.</u>				3.5	12.6	3	

71.88 18.48 1.48 1.48

122.0 70.28 65.88 75.49 333.7

Item 20. page &

PNM Resources

Summary: This company operates electric and gas utilities in New Mexico through Public Service Company of New Mexico, and sells wholesale power in the western U.S.

06-SEP-03 Sub-Industry: Electric Utilities

STOCK REPORTS

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\$\frac{3}{6} \frac{3}{6} \fra 8 52 ಜ 5 Lamings vs. Previous Year AM JASON DI FWAM 10 Week Mov. Avg. -30 Week Mov. Avg. Relative Strength Yield • 3.3% 12-Mo. P/E • 19.5 Price As Of 9/06/03 - 27.75 52 WK Pange - 28.31-17.47 Technical Eval.

• Buildish since 8/05 ELECTRON, PRESENTE Rel. Strength Rank Land of the col insider Activity • Neutrel Quantifative Evaluations Feir Villa 26,00

in April 2003, PNM retereated its estimate of 2003 EPS from pronthing operations of \$1.80 to \$2.05 (excluding one time as goards and orbations of \$1.80 to \$2.05 (excluding one time and dearties). A planned maintenance outsige shut down the same and orbations of the company's San Juan Generating Station as experienced intermittent forced maintenant in Particularly and Meach. The restricted exemitating of the San Juan plant of the properties of intermittent forced outsiges in February and Meach. The restricted exemitating of the San Juan plant due to those operate outsiges added, about \$5.5 million to purchased power in the appearant in 10 induces PMM's electric rates by the supervised as appearant in 10 induces PMM's electric rates by \$4.00 to \$1.00 Opportunit Newtow - 18-JUL-03 Business Profile - 18-JUL-03

Value of \$10,000 invested five years, ago; \$ 16,520

89

Flecal Year Ending Dec. 31

8

Shareholders Market cap. (B) Inst. holdinge

0.62 40.2 0.174 26.68

Key Stock Statistics
Dividend Rete/Share
She outsig (M)
Ang daily vol. (M)
Tang Sk. Vaka/Share
Beta

272.8 201.4 340.6 1,158

2.36.5 2.36.5 2.36.5

2332

22825

Dividend Data (Dividende have been paid aince 1996.) Operating-reventures in the three months ended March 31, 2003, transe 25th; year to year, on a 2505, gain in electric reversition coupled with a 34% gain in pass revenues. A long term hower asks contribut with the U.S. Navy, increased asks provide asks contribut with the U.S. Navy, increased asks provide asks contributed overheat and higher interior proper and provide asks of the sphiltonit vicrosesse in the cost of energy soid; the applictment of the cost of energy soid; and not other expenses of \$4.3 million, versus income of \$7.4 fifthing, income field \$95%, to \$10,894,000 (\$0.27 a share, a there preferred dividends), from \$24,949,000 (\$0.27 a share). Results in the 2008 period exclude a credit of \$0.05 a share. If the excounting character a credit of \$0.05 a share.

1 the paint 50 trading days, PNM's shares have increased community of the paint for a 25 paint. In this 842 500. Average inciding old incident for the paint fifty they was 159,975 shares, compared the type Copy with 150,221 shares.

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Oct. 0 Pec. 0 Jel. 13

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For important regulatory information, go to www.standardandpoors.com, 'Ragulatory Disclos eding any and all of purpoque and should not be considered a solutional to buy or and any socurity. Nathay SAP not from the unite. The distriction is provided with the security produced against the total. impressed in this research import accurately reflect the research analyst's parnoval views regar piffort wife, it, or will be, divisity or indirectly, related to the specific recommendations or view

STOCK REPORTS NYSE Symbol PNM

PNM Resources, Inc.

Business Summary - 18-JUL-03 In S&P MidCap 400

06-SEP-03

Plant Resources is the hoding company for Public Service PNM Resources is the hoding company of Public Service Company of New Mexico, a utility involved in the generation, transmission, distriction and seal of electricity and natural gas in New Mexico; it also sells power in the wholesale merrical that the securces in New Mexico; it also sells power in the wholesale merrical sells of the securces, inc., creating two substitutes to separate deregulated activities, as required by the Electric Utility industry Restructuring Act. The company Poperations in the sell-sells sells and interesting operations; and unregulated operations. Operated and marketing operations; and unregulated operations of the prompany provides ulrisdictional exal lead of the first market bed 384,478 retail selection by the board and the sells of the metal of the the orner pany and the metal of

time period. The fourth market consists of energy sakes from excess capacity made on an hourly basis at varying spot market prices. As of December 31, 2002, total net generation capacity of facilities owned or leased by the company was 1,742 MW, with the San Julan Generating Station at 766 MW. Four Corners 182 MW, Fato Verde Nuclear Generating Station is to 300 MW. Recens Station 154 MW After 141 MW, Lord-shorp 80 MW; and Las Vegas Station 20 MW. PMM also purchases power in the market under contracts.

Unapplated operations are conducted through which owned Aviets. In July 2001, Aviets wound down all operations are conducted through which owned Aviets. In July 2001, Aviets wound down all operations are expet for its Relation business until which provides maintained actions to the electric power inclusity. Aviets maintained previously divested the Erectific power inclusity. Aviets in had appreciately divested the Erectification of Erectification of Erectifica

	Per Share Data (\$)										
	(Year Ended Dec. 31)	2002	2001	2000	900	1996	1907	1996	1986 200	18	500
	Tangible Bk. Val.	24.90	22.62	23.63	21.79	20.61	19.25	180	16.80	15.09	13.29
5048	Earnings	1.61	3.77	2.53	2.01	2.28	1.92	1.72	1.72	1.77	-
=	S&P Core Earnings	0.88	3.37	ž	ž	ž	ž	≨	ž	ž	ž
š	Dividends	0.86	980	0.00	0.00	0.77	0.63	8	ž	Ž	Ž
!	Payout Ratio	53%	21.8	Š	\$	34%	33,	<u>%</u>	ž	Ž	Ž
,	Prices - High	30.76	37.80	28.31	21,50	24.75	23.68	8	18.25	20.5	18.67
	mon.	17.25	22.87	7.62	14.84	17.37	15.75	17.25	12.12	90	6
	P/E Ratio - High	5	2	Ξ	=	=	12	2	=	4	2
	- Low	Ξ	80	9	7	80	60	2	7	•	Ž
8	Income Statement Analysis (Million \$)										
I	4170		4								

1991	income Statement Analysis (Million \$)										
	Reve.	1,169	2,352	1,611	1,158	280	1,135	883	908	908	874
	Depr.	둺	3 2 3	83	23.7	8 6	28	8 2	80.8	Z	7.3
-	15 17 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ž	≨	ž	¥	51.7	8 7	48.7	56.8	1.0	998
	Tid. Clos. Cov.	2.56 2.56	3	9	2.70	98.8	8.54	3	2.00	2.53	2
	Constr. Credite	≨	ž	ž	₹	芝	₹	쿧	Ž	0.27	0.42
158	Eff Tax Rate	3	86.0%	4.4	7	37 P.X	86.9%	36.5% 36.5%	8	96.5%	₹
ļ	Net inc.	2	S	₽	78.6	58	9	72.6	75.6	903	40
	S&P Core Earnings	2.7	133	¥	ž	ž	ž	ž	≨	≨	ž
900	Belones Sheet & Other Fin. Date (Millio	3									
	Gross Proc.	3,100	2017	2774	286	3 118	0 6441	2 400	0 447		0
	Oap, the	4	2	7	1		-		9	-	į
	Net Prop.	9	7	3	3	=	-	3	1.674	3	
	Captadization	•					ļ	ļ	į	į	
	LT Debt	8	ş	3	#	,000 ,000	71.	ž	2	2	3
	% [T] Deck	48.8	ب به	8	52.3	55.2	46.6	6.9	46.9	61.5	000
		12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	77.0	8
3		8	80	0.58	0.0A	0.60	0.00	0.80	0.80	5.30	8
1	Common	3	8	8	798	8	\$	ž	202	3	33
T THE LANGE	* Contimon	40.5	47.8	6.8	47.0	46.4	3	45.8	1	43.2	7
	Total Cap.	2,148	2,028	2,118	2,105	2,082	1,710	, 854	1,589	909,	1,72
	A Oper, Patto	\$2.3	90.2	83.0	1.10	84.2	9.00	85.8	98.0	83.3	3
NOV 15	S Early on Net Prop.	5.6	<u>=</u>	80	7.5	8,6	£.7	₩.	9.0	8	7.7
4 33	A Reliation Party	5.5	7	6.3	80	. B.7	7.1	6.3	6	8	Ž
May 16 03	A Refum On Image Capital	3	7 0.	7.9	7.2	3	10.9	4.	11.5		£.4
Aug. 16 03	% Return On Com. Equity	7	99	=	0.	11.3	10.3	8)	10.8	12.4	Ī

Other (Avenich Straw, Abuqueque, NM 8718, Te. (200) 241-2700, Website — Hig./News.prin.com Christi, Pres & CDO.—). E. Sterin. 1989 & CDO.—). E. Sterin. 1989 & CDO.—). E. Sterin. 1989 & CDO.—). E. Sterin. 1989 & CDO.—). E. Sterin. 1989 & CDO.—). E. Sterin. 1989 & CDO.—). E. Sterin. 2089 & CDO.—). E. Ster Data as page but youths of doc quastrooc term. Per show that so, the Epid denotes dataset EPS (1438-125)-price periods he Effected of MARIOLA Avalable. NATHOL Majoringet, NRTHOL Resided.

STANDARD

&POOR'S

STOCK REPORTS

OB-SEP-03 - Beb-Industryn Electric Utilities

Outbook (1 Loweel—8 Highest) Fair Value

Beartain since 7/03 Eam,/Div. Rank Fechnical Eval.

Ref. Strength Renk (1 Lower: 40 Highest) naider Activity Unfavorable

Overview - 27-AUG-03

After an anticipeted 4% decline in 2003 EPS from ongoling operations (from 2002's ongoling operating EPS of \$3.81), we project operating EPS to grow about 5% in 2004. Our projection of a decline in 2003 prinarily reflects the issuance of stares and shares an November 2002, the 66% increase in of about \$600 million were used to reduce debt in the first half of 2003, FOIA earned \$1.46 is about \$0.25. Not proceed to the production of the production, the company will have to determine whether it should confinue production, which currently results in about \$0.70 a share in annual tax credits. Atthrough 2002 entimeted to spring operating EPS benefitted by about \$0.45 from the chamber of growthill annual tax credits. Atthrough 2002 entimeted by about \$0.45 from the chamber of \$1.38. The sale of North Carolina Natural Gas (North) was expected to close in the firiting quarter, with net and proceeds to be used to pay down debt. The Forder Progress resistance to 20.3 Standard and Poor's Core Earnings per share \$1.88. \$1.89.

Arkuetlon - 27-AUG-09

Statistics	
Key Stock	
_	•

	S&P EPS Est. 2003	6.	Taren St. Volum/Orann	10.00	
_			The state of the s	2	
	THE OF SAF EST. 2003	4.	Beta	2	_
	S&P EPS Est 2004	988	Shereholdece		
	0	3		200	_
	Cividend Hate/Share	2.2	Marke Cao (B)	40.0	_
	Sha nesteto (M)	7 070	(
	fuel money	7	INST. HONOMARS	Š	-
	Avg. delly vol. (M)	0.582			
	Value of \$10.	4	Value of \$10,000 languages of \$1.		_

Value of \$10,000 invested five years ago: \$ 12,161 Flecal Year Ending Dec. 31 2003 2002 2001

200						3,358 3,130
400		877.1	RGD 3	7	285	4,119
		1.908	2.318	2331	1,907	8,461
	=	1.767	1,959	2 277	1,922	7,945
	nes (Million	2,016	2,013	1	ı	1
	Reven	ō	8	8	ç	×

82868 55852

Dhildend Deta (Dividends have been paid since 1937.)

Payment	Nov. 01 '02 Feb. 01 '03 May. 01 '03 Aug. 01 '03
Stock of Record	Oct. 10 Jan. 10 Apr. 10 Jul. 10
4 4 4 4	Oct. 08 Jan. 08 Apr. 08 Jul. 08
8 8	Sep. 20 Dec. 11 Mer. 19 Mey. 14
(B)	0.545 0.560 0.580 0.580

utilise or insuers. No part of Nest to Educatory or makes Fire Important regulatory information, go to wave standardsordpores con and in this research report iscussing reflect the research energies personal where regu-neal. It, or side by, describe or indirectly, related to the specific automortalistics or view

NYSE Symbol PGN

アードンをあることがおりのなるこれの情報のアー

Progress Energy

In 84.P 500

Burnmary: The holding company was renamed after the coquellies of 8t. Pa-tersburg-based Florida Progress Corp. by Rateigh-based CP&L Energy.

Progress Energy, Inc.

Desires Symmety 27-400-03 STOCK REPORTS

8 ŧ \$

A-Up V-Down P-No Change

Yield • 5.4% 12:440, P/E • 15.1

Price As Of 9/06/03 • 41.73 52 Wk Range • 48-32.84

The company (committee of the company observed to name to any Progress Endry, Inc., in December 2000.

On November 30, 2000, the company exquired Florida Progress Endry, Inc., in December 2000.

The Charles Company scale of the Company or Spride Boyes (company of Florida Progress (55%), plus the assumption of \$2.7 billion of FPC debt. FPC was the holding company for Florida Boyes (how operal ing as Progress Energy Florida), which provides electricity to or Charles Florida.

Charles Florida.

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And South Cardina, and after the 1999 acquisition of after the 1999 acquisition of after the 1999 acquisition of after the 1999 acquisition of after the 1999 acquisition of after the 1999 acquisition of after the 1999 acquisition of after the 1999 acquisition of after the 1999 acquisition of after the 1999 acquisition of the 1900 action and 1900 acquisition of the 1900 acquisition in cash. The sale was expected to close in four filter florida for the 1900 acquisition of the 1900 acquisition and distribution operations for Cardina has been penetation and distribution operations for Cardina has been penetation operations, energy trading and system plans sol

22 8

10 Week Mov. Avg. 30 Week Mov. Avg. Relative Strength

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mary: Progress Energy Venetics, from the progress of the progr

in 2002, the utility operations appointed for 1811's of Polity consolidated revenues (§1.1% in 2001), and the distribution businesses. 1.6.9% (§18.9%).

Carolina Utility Commission (in December (909) and the South Caroline Utility Commission (in December (909) and the South Caroline Public Services Commission), through \$189) as accelerate the amortization of its funders generating issued attition will range from \$100 million to \$150, million, for a rocal of \$750 million.

Company subsidiaries include Progress Teleocon, acuse super-regional carrier with a network that afrechee across five states from New York to Marul, FL, with pateways to Letin America; Carones, which provides fibar-cycle aleconnications services; and Progrese Rail Bervices, which supp

Year Ended Dec. 31)										
Engine Bk. Val.	2002	2001	2000	<u>+</u>	1988	<u>8</u>	8	1	្នំ	# N
	10.40	40.60	5	4						
- Carlings	3	8	-	2	02.4	18.18	17.16	16.00	2	ž
and the same of th	2.53	7.0g	8	255	2.75	٠ چ	3	9,40	2	
ar Core Earnings	200	250	¥Z	A TA	4			,	3	2
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	D .	Z. 12	9	8	96:	2 8	- 58	2	2	\$
	898	ŝ	68%	40	7	71.0	A50	•		
	02.63	40 2K	40 27	47.07			8	R ;	\$	Ę
			5 6	ò	49.02	4.00 6.00	2.3	8	800	3
	Ę	9	S	29.55	9.6	32.75	33.73	2	2	27.03
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ncome Statement Analysis (Million 5)							,			100.00

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A Common	40.4	38.5	47.6	2	8		ŝ		Ę	
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THE LANGE CALCADORNIC	Ņ	9	7.1	7.3	7.6	7.7	4	. ,		
A HERLIN ON COM. Equity	8.7	9 .6	10.8	11.9	13.7	2.5	4.	٠.		

Data as onto report, befinestifie of disc operations: fema. Per sham data act, for att. dive. Bold denotes diluted EPS (FASB 128)-prior periods meatan E-Estimated NA-Not Available. NM-Not Meaningful. NR-Not Ranked.

STOCK REPORTS

Southern Co.

NYSE Symbol SO

In S&P 500

The Southern Containly to one of the largest U.S. producers Bustness Summery - 30-MAY-05 STOCK REPORTS

Bummary: This Atlanta-based energy holeting company, which apen off its Minane subsidiary in April 2001, is one of the largest U.S. electricity producers. £ 8 8 ଯ हु≝ 10 Week Mov. Avg. 30 Week Mov. Avg. Relative Strength... Yeld - 4.8%. 12-440, P/E - 14.0 Price As Of 9/05/03 + 28.97 52 Wk Range • 32-24.80 06-SEP-03 Sub-Indisetry: Electric Utilities riP Spinion, Hold (* • • •) Technical Eval.

Bearish since 7/03 Outbook (**Lowest - 6 Highwar) Ref. Strength Rank (1 Lowest - 99 Highest) Earn,/Div. Renk **Quantitative**Evaluations naider Activity Fair Value

Overview - 29-MAY-03

Neutral

Teng. Bk. Value/Shart Beta

Key Stock Statistics

Shareholdere

We expect 2003 EPS about equal to 2002's EPS of \$1.85, which was aided by \$0.05 from the weather and \$0.06 from Prone-Live (nostly tax related) firms. Our 2003 estimate are all class an expected second quarter one time gain of \$0.12 for the meat. After the 2004 for sprind for Mirani. \$0 has focused on its free galacter of sprind for Mirani. \$0 has focused on its free regulated to sprind for Mirani. \$0 has focused on its free regulated the spring-related retail businesses. With bring-bern continued in the Southeast, and its unregulated retails businesses. With bring-bern continued to the state reducing risk, we expect the wholesses power unit to by 2005. Over the same period, income from unregulated retail units is explained to grow fire-fold. In about \$50 million, the unities early customer growth of 2% and demand of from the second of the superior of no wearge amountail ESS growth of 3%, we expect \$0 to average amountail ESS growth of more than \$5 over the long term, alded by 15% growth of 2% sandard & Poors Core Earnings per share at \$1.65. Valuation - 29-MAY-03

Hawing outperformed electric utility peers in 2002, the stock of the subject of t

Value of \$10,000 invested five years ago: NA 1.40 Mariet cap. (B) 728.5 .. Inst. holdings 1.844 2,270 2,361 3,165 10,200 35555 Flace! Year Ending Dec. 31 2,214 2,631 3,248 2,457 10,549 35325 S&P EPS Est. 2003
P/E on S&P Est. 2003
S&P EPS Est. 2004
DWrdend Rase/Share
S/ns. custog. (M)
Avg. dasky vol. (M)

Dec. 06 '02 Mer. 06 '03 Jun. 06 '03 Sep. 06 '03 Stock of Record Nov. Or Feb. 03 May. 05 Aug. 04 Oct. 31 Jen. 30 May. 01 Jel. 31 Ę, Oct. 21 Jen. 16 Apr. 21 0.343 0.343 0.360

Dividend Data (Dividends heve been paid since 1948.)

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Por Improvines

Any and all of the subject securities or lettern. No part of experienced in this research report

The Passes of the Passes

The Southern Company

Might-pearly 35,000 megaturants of generating capacity, this father-based utility hadding company serves approximately 4 milliand customers in the Southwest through the integrated meditation customers in the Southwest through the integrated meditation customers and Savannah Electric & Power. The Southern Power authediany serves both the utility subsidianted and the wholesale power market.

SO's electric revenues accounted for 38, % of crossicities and the wholesale power market.

SO's electric revenues by ourse to solve the solve of revenues in 2002 (94,7% in 2002). Electric revenues by ourse revenues in 2002 (94,7% in 2002). Electric revenues by ourse rowmercial. 30,4% (20,8%), industrial, 35,9% (33,6% in 2001). Sournee of fuel for the Southern system in 2002 were. coal. 69% (12.2%), and other, 0.9% (19%). Sourneer of their for the Southern system in 2002 were. coal. 69% (72% in 2001). Rucker; 16% (19%, 16%), industrial and finance wholesale generating assets in the Southesst. Freely from SPC's assets was to be marketed to wholesale. In Electry from SPC's assets was to be marketed to wholesale. In Electry from SPC's assets was to be marketed to wholesale. The resign Marketing authentity acquarity at December 31, 2002.

through 2004 at 22.08 pageath during the jainted 2002.

In 42.59 ballion in 2004.

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2000, SO completed an IPO of 19, "A of in Southern Energy
subolidary (fenamed Mirent in Jaintery 2001), a global interest in Mirent in Jaintery 2001, a global interest in Mirent in Jaintery 2001, a global interest in Mirent in Jaintery 2001, a global interest in Jaintery Indiana and Jai were \$1.47 billion.
SO is also the perent company for a system service com-pany that provides, at cost, specialized service to the perent and its subsidiaries; Southern Telecom, which provides who iber optic solutions to telecommunication providers in

the Southeast Southern Communications Services (Southeast LINC), which provides digital wireless communications Services to the five utility subsidiaries, as well as to the general public within the Southeast and Southern Nuclear, which provides services to Southern Companys unidear power plants. In Jure 2002, SO formed Southern Companys unidear power plants, owned unit that began operation in August 2002 as a retail fee marketer in Georgia. In July 2002, the unit acquired from The New Power Company (but of barintapity) 210,000 retail gas customer in Georgia, for about \$60 million.

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Cinergy Corp.

&POON.

STOCK REPORTS

30-NOV-02 Sub-Industry:

In S&P 500

NYSE Symbol CIN

Summary: CIN is the holding company for Cincinnati Gas & Electric. Co. and PSI Energy, serving more than 1.5 million electric and 495,000 gas customers in Indiana, Ohio and Kentucky. 12-Mo. P/E - 14 1 Yield • 5.6% Price As Of 11/29/02 = 32.40 52 Wk Range = 37.16-25.40 S&P Opinion: Hold (* * *)

Bearlsh since 11/02 Rel. Strength Rank (1 Lowest - 99 Highest) • Average Eam./Div. Rank Ourlook +1 Lowest-- 5 Highs Quantitative Evaluations Technical Eval. Fair Value • 30.80

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4

10 Week Mov. Avg. 30 Week Mov. Avg. Relative Strength

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Insider Activity
• NA • 20

where leaves in the nature in 1990 in

We recommend holding CiN shares. The stock was re-xx decrease for the S&P in 2002 (compared to a nearly 13% or decrease for the S&P index of Electric Utilities). This follows at 48% decline in 2001 (versus an 18.6% drop for that index). The increase in 2002 has been fueled in part by rumors related to CiN's appeal as a potential merger partner. In 2000, the stock recovered from a sharp 30% drop in 1990 (when the shares were hurt badly by CiN's default on its power contracts), and ad A vanced over 46%, aided by favorable regulatory devel. ilva for the insome orbited investo This report is for information purposes and should not be considered a solicitation to bey or seal any security. Veiller SAP not any other partly guarantee its accuracy or make warrantee insugarding results from its usage. Redistribution is prohibited without written permission. Capyright is 2002.

18.89 -0.06 58.601 \$ 5.6 Value of \$10,000 invested 5 years ago: \$ 12,161 Temp. Blk. Value/Shy Bets May Stock Startistics
S&P EFS Est. 2002 2.1
Piff on S&P Est. 2002 2.2
B&P Eff Set. 2002 2.2
BM Chirth (M) 184
Avg. daily, vol. (M) 0.86

Placed Year Ending Dec. 31 200 2001

27.0 0.36 0.70 0.70 20.00 0.07 0.08 0.45 1.86 275 276 278 278 288 838 0.37 0.78 0.60 2.63 25.20 57.73 57.73 52.30 52.30

Dividend Data (Dividends have been paid since 1853.) fext earnings report expected: late January Stock of Š

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Constellation Energy Group SQNEOV-OZ reducing the residency of the sound of the soun ## Mar. 11 Apr. 01 '02

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Constellation Energy Group, Inc.

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Office—C50 W. Prett Street, Be Polychotex, Pres & C50—Li, A. St Bocker, J. T. Brady, F. R. Bramble Lamori, R. J. Lawsee, C. H. Ponti and Trust Co., New York, Incompor

RPOOL

STRK KEPORIS

30-NOV-02 Sub-Industry:

Summary: This energy holding company for Detroit Edison acquired Detroit-based MCN Energy Group, the holding company for Michigan Consolidated Gas, in 2001.

T.

Price As Of 1/29/02 • 44:33 Fer Freid • 4,6% 52 Wk Range • 47.70-33.05 12-Mo. P/E • 11.2 S&P Opinion: Hold (***) Technical Eval.
• Bullish since 10/02 Outbook (1 Lowest --5 Highest) Ref. Strength Rank Eam./Div. Rank Insider Activity Quantitative Evaluations

Fair Value

· Low

Overview - 21-AUG-02

We expect EPS in 2002 to advance approximately 10% of them 2001's operating EPS of \$3.48. Earnings will depend on the timing of an economic recovery, as well as the impact of the implementation, on January 1, 2002, of customer choice of electric supplier, DTE anticipates a 5% to 6% decrease in its electric Cach However, we expect the company to experience interested controllarly from the co-al based tuels segment. After state legislation reduced residential rates by 5% as of June 5, 2000, the Michigan Public Service Commission authorized Deficial Calcius Commission authorized Deficial Calcius Commission authorized Deficial Calcius Commission authorized Deficial Calcius Calcius Camission authorized Deficial Calcius Calciu

Valuation - 21-AUG-02

We would hold the shares. The stock was recently up the about 13% and 30% for the SAP Electric index and Gas Utilities Index. X in 2002, versus declines of about 13% and 30% for the SAP Electric index and Gas Utilities Index. X is all the shares nose 77% versus declines of X is trunched to the indexes. The relatively the indexes is the indexes in an authoritie was a good one with the contiguence to impulsion was a good one with the contiguence in a contiguence in a contiguence of the Electric Utilities index), but rebounded 18% from an early March low, reflecting the anticipated 67% from an early March low, reflecting the anticipated 67% from an early March low, reflecting the anticipated 67% from an early march low, reflecting the anticipated 67% from an early march low, reflecting the anticipated 67% from an early march low, reflecting the anticipated 67% from an early march low, reflecting the anticipated 67% from an early march low, reflecting the anticipated 67% from an early march low, reflecting the anticipated 67% from an early march low, reflecting the anticipated 67% from an early march low, reflecting the anticipated 67% from an early march low, reflecting the anticipated 67% from an early march low, reflecting the anticipated 67% from an early march low, reflecting the anticipated 67% from an early march low, reflecting the anticipated 67% from an early march low, reflecting the anticipated 67% from an early march low, reflecting the anticipated 67% from an early march low and early march low and early march low and low Edison's stranded costs. With a secure dividend yielding about 4.9%, the stock remains attractive for income-oriented investors.

achickation to buy or set any r make werrantee regerding mission. Copyright © 2002 This report is the information purposes and should not be considered as security. Nation: S.R.P. not any other party guarantee its accusacy or results from its usage. Referencesion is probibled without written pair. Itam 20, page

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Teng. Bt. Value/Share Bets Flecki Year Ending Dec. 31 Value of \$19,000 inves Key Stock Statistics
Sub EPS Ent. 2002
Fig. in: Sub EPS Ent. 2002
Giv/dent Pates/Strue
Phys. colamp. (M)
Ang. delay, (M)
Ang. delay vol. (M)
O/70, delay vol. (M)

968.8 1,030 1,030 3,764 0.00 E

(Dividends have been paid since 1909.) mid February Dividend Data

Apr. 15 '02 Jul. 15 '02 Oct. 15 '02 Jun. 15 '03 Mar. 25 Jun. 28 Sep. 26 Dec. 23 Mar. 21 Jun. 28 Sep. 24 Dec. 19 Feb. 28 Aug. 13 Nov. 28 0.515 0.515 0.515

DTE Energy Company

NYSE Symbol DTE

DTE Energy

In S&P 600

Month of the control

Common

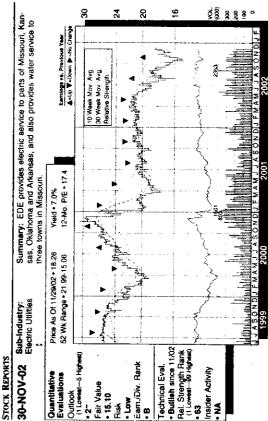
STANDARD

1

Empire District Electric

NYSE Symbol EDE

& POOR'S



Business Profile - 03-SEP-02

6.796 \$0.411 32%

8

The company attributed its strong second quarter results to an increase in Missouri rates granted by the
Missouri Public Service Commission (MPSC) in September 2001, and the June 6, 2002, settlement with
respect to inferim Energy Charge (EIC) refund provisions. Significantly lower gas prices and more favorable
weather conditions in the second quarter of 2002, versus the second quarter of 2001, also boosted earnings. In July, a subsidiary of EDE joined with seven other
ucts Department of Eagle Porter Technologies, LLC,
ucts Department of Eagle Porter Technologies, LLC,
ucts Department of Eagle Porter Technologies, LLC,
anducks, LLC, specializes in close loleismore custom
manufacturing for the aerospace, electronics, telecommanufacturing for the aerospace, electronics, telecommanufacturing of the aerospace, electronics, telecommanufacturing and mechaniery indicatives, including comporents for specialized batteries for Eagle Picher Technolents for specialized batteries for Eagle Picher Technolents for specialized batteries for Eagle Picher Technolents for specialized batteries for Eagle Picher Technol-

Operational Review - 03-SEP-02

Revenues in the six months ended June 30, 2002, grew 20, 2002, gre

Stock Performance - 29-NOV-02

In the past 30 trading days, EDE's shares have in-creased 17%, compared to a 6% rise in the S&P 500. Average trading volume for the past five days was 46,890 shares, compared with the 40-day moving aver-age of 57,787 shares.

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Value of \$10,000 invested 5 years ago: \$ 13,025 Shareholders Market cap. (B) Inst. holdings Fiscal Year Ending Dec. 31 2002 2001 2000 1.28 Key Stock Statistics
Dividend Hate/Shere 1.
She outsig. (M) 22
Ang dality vol. (M) 0.0
Tang Bk. Vabue/Shere 14.
Beta. 0.0 58.40 58.40 61.96 5885

Next earnings report expected: early February 2 2 2 2 2

Payment Deta Dividend Data (Dividends have been paid since 1944.) Stock of

Dec. 01 Mar. 01 Jun. 01 Sep. 01 Nov. 28 Feb. 27 May. 29 Aug. 28 Oct. 25 Apr. 23 25. 25. 23 25. 25. 25. 0.320 0.320

Dec. 15 '01 Mar. 15 '02 Jun. 15 '02 Sep. 15 '02

A Diretton of The McGraw-Hill Companies

The Empire District Electric Company

STOCK REPORTS

Business Summary - 03-SEP-02

Empire District Electric (EDE) generates, purchases, transmitis, distributes and sells electricity in parts of Missas out distributes and sells electricity in parts of Missas out in 2001, nearly all gross operating revenues came from electricity seles, with under 1% from water sales. EDE's service ferritory consists of approximately pil 10,000 square miles and a population of more than 560,000, primarity throughout southwestern Missouri ful 360,000, primarity throughout southwestern Missouri ful 360,000, primarity throughout southwestern Missouri ful southeastern Kansas, northeastern mickinsas, Cklahoma and Arkansas outsigners provided 6%, 3% and 3% of total electric revenues, respectively. In 2001, 42% of EDE's operating revenues are as anne from gresidential customers. Commercial, industrial, wholesale microarchitals.

incorporated communities, to various unincorporated ar-eas, and at wholesale to four municipally owned distri-bution systems and two rural electric cooperatives. The largest urban area served is Joplin, MO, and its imme-diate vicinity, with a population of 157,000. EDE oper-ates under franchises with original terms of 20 years or respectively.

The company supplies electric service at retail to 119

honger in virtually all of the incorporated communities.
About 51% of electric operating revenues in 2001 came trom incorporated communities with franchises having it least 10 years of least 10 years of least.
Incorporated communities in which franchises have remaining terms of 10 years of least.
Based on kilowalt hours generated, coal was used to supply 70% of folal fuel requirements. Natural gas supplied 29%, with oil generation providing least shart 1%.
EDE expects to increase the amount of gas used as a fuel source. Construction spending totaled about \$71.8 fuel.

million in 2001. The company projects that construction spending wilt RISE to \$72.2 million in 2002, and \$85.8 million in 2003.

The maximum bourly demand on the company's system acached a record high of 1,001 mapawatis on August 9, 2001. The previous record peak of 993 megawatis was established in August 2,000. EDE set a new maximum hourly winter demand of 941 megawatis on December 19, 2000.

In May 1999, EDE agreed to be acquired by UnitCorp United, inc., a Kansas City, McDeased electric and gas unity, for approximately \$600 million, including \$505 million in stock and cash and the assumption of \$260 million in debt in January 2001. UtiliCorp terminated the agreement, citing lack of receipt of necessary regulations. latory approvats

13.00 1999 1997 1996 1995 1994 1993 1994 1993 1994 1993 1994 1994 138 13	Per Share Deta (\$)										
Market M	(Year Ended Dec. 31)	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992
1.56	Tengible Bk. Val.	13.32	13.43	13.24	13.18	12.84	12.72	11.72	12.06	11.37	12.29
128 128	Earnings	0.59	1,35	1.13	53	2	1.23	1 18	8	116	126
NM 85% 113% 84% 99% 104% 108% 97% 110%	Dividends	1.28	1.28	82	1,28	1.28	1.28	- 58	1.28	1.28	1.26
26.56 30.75 26.17 26.10 19.50 19.75 15.05 24.87 26.10 19.75 15.05 19.17 15.05 19.17 15.05 19.17 15.05 19.17 15.05 19.17 15.05 19.17 15.05 19.17 15.05 19.17 15.05 19.17 15.05 19.17 15.05 19.17 15.05 19.17 15.05 19.17 19.17 15.05 19.17 19.1	Payout Ratio	Ž	95%	113%	8	%66	8	108%	91%	110%	3001
operation of the control o	Prices - High	26.56	30.75	26.75	26.12	20.00	19.50	19.75	20.50	24.87	24.75
Maintain	· Low	17.50	18.93	20.68 20.68	18.37	15.75	17.12	15.87	15.00	19.12	20.12
West Company (Million) \$1. 30 14 18 12 12 14 13 11 16 ment Analysis (Million) \$1. 264 280 242 242 290 296 178 178 168 295 278 284 250 234 216 199 183 174 188 168 w. 1.91 1.48 1.62 260 234 216 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30	P/E Ratio - High	45	g	24	4	16	16	17	16	21	R
Mailton Mail	· Low	8	14	2	12	12	4	13	£.	16	16
2.64 280 242 240 215 206 193 178 168 2.95 27.8 284 25.0 234 216 193 178 168 19, 114 21 148 126 22 23 23 26 26 27 30 27 144 230, 42% 36% 36% 35% 35% 35% 35% 35% 35% 144, 394, 42% 36% 36% 35% 35% 35% 35% 35% 140 1049 820 820 819 820 819 197 159 1,100 1049 820 820 819 877 623 508 114 44 39 1,100 1049 820 840 840 840 859 871 84 44 44 1,100 1049 820 840 840 840 220 195 185 165 1,100 1049 820 840 246 196 220 195 185 165 1,100 1040 820 840 240 239 329 329 329 199 1,100 1040 820 840 840 230 1,100 1040 857 867 591 527 540 491 459 406 1,100 1040 857 867 591 527 540 491 459 406 1,100 1040 801 801 803 872 872 873 111 95 1,100 1040 801 801 801 801 804 872 873 111 95 1,100 1040 801 801 801 804 872 873 111 95 1,100 1040 801 801 804 97 97 95 106 94 1,100 801 801 801 804 97 97 95 106 94	Statement		*								
295 278 284 255 234 216 199 183 174 s 194 148 148 175 26 29 26 26 27 30 27 s 3.8 6.8 42% 30% 32% 35% 35% 35% 35% 14.4 23% 42% 30% 32% 35% 35% 35% 14.4 23% 42% 30% 32% 35% 35% 35% 15.0 1049 280 886 810 75 629 657 587 79.4 134 134 820 886 810 75 623 508 716 444 750 720 616 572 547 515 476 446 394 750 720 616 572 547 515 476 446 394 751 868 240 244 250 219 329 329 329 329 752 40 42 730 710 780 840 230 753 42 40 45 40 46 46 46 46 49 752 83 63 72 561 551 710 108 840 230 753 82 82 82 82 82 82 82 82 82 82 82 82 82		262	88	242	240	215	506	193	178	99	150
W. 19.1 14.8 16.3 17.5 12.8 13.7 12.8 10.9 10.9 s 13.4 26.8 12.6 0.4 12.6 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 27 30 37 30 <t< td=""><td>Depr.</td><td>29.5</td><td>27.8</td><td>56.4</td><td>25.0</td><td>23.4</td><td>21.6</td><td>19.9</td><td>18.3</td><td>17.4</td><td>16.5</td></t<>	Depr.	29.5	27.8	56.4	25.0	23.4	21.6	19.9	18.3	17.4	16.5
14 21 26 29 26 27 30 27 14% 39% 42% 36% 36% 35% 35% 35% 35% 14% 39% 42% 36% 36% 35% 35% 35% 35% 100 1049 820 826 819 872 198 197 159 1100 1049 820 826 819 871 872 874 120 120 120 820 826 872 873 874 120 120 826 346 246 196 220 195 185 120 120 826 346 246 196 220 195 185 120 120 826 346 246 196 220 195 185 120 120 826 346 246 196 220 195 185 120 120 826 346 246 196 220 195 185 120 120 821 822 829 329 329 120 821 822 829 829 829 829 120 821 822 825 821 821 821 120 822 823 72 825 72 71 120 823 821 822 825 825 120 821 822 825 825 72 120 821 822 825 825 72 120 821 821 821 825 825 120 821 821 821 825 825 120 821 821 821 825 825 120 821 821 821 825 120 821 821 821 821 120 821 821 821 821 120 821 821 821 821 120 821 821 821 821 120 821 821 821 821 120 821 821 821 120 821 821 821 120 821 821 821 120 821 821 821 120 821 821 821 120 821 821 821 120 821 821 821 120 821 821 821 120 821 821 821 120 821 821 821 120 821 821 821 120 821 821 821 120 821 821 821 120 821 821 120 821 821 120 821 821 120 821 821 120 821 821 120 821 821 120 821 821 120 821 821 120 821 821 120 821 821 120 821 821 120 821 821 120 821 821 120 821 821 120 821 821 120 821 821 120 821 120 821 821 120 821 821 120 821 821 120 821 120 821 821 120 821 120 821 120 821 120 821 120 821 120 821 120 821		19.1	14.8	18.3	17.5	128	13.7	12.8	10.8	10.6	103
\$ 3.8 \$ 5.8 \$ 1.2 \$ 0.4 \$ 1.2 \$ 1.0 \$ 0.2 \$ 1.0 \$ 0.2 \$ 14% \$ 33% \$ 42% \$ 36% \$ 3	Fxd. Chgs. Cov.	*	ci	5.6	2.9	5.6	26	2.7	30	2.7	24
14% 33% 42% 36% 35% <td>Constr. Credits</td> <td>3.8</td> <td>5.8</td> <td>2.</td> <td>4.0</td> <td>12</td> <td>1.0</td> <td>2.2</td> <td>10</td> <td>0.5</td> <td>0.1</td>	Constr. Credits	3.8	5.8	2.	4.0	12	1.0	2.2	10	0.5	0.1
I.O.A. 22.5 28.3 23.8 22.0 19.8 19.7 15.9 I.O. Tools (Million \$) 1.0.0 1.0.49 92.0 89.8 810 75.7 69.9 657 587 787 787 787 788 789	Eff. Tax Rate	14%	33%	4 2%	%96 36%	888	35%	35%	32%	33%	33%
## Other Fin. Data (#lillion \$) 1,100 1,049 820 836 810 757 689 657 587 154 134 719 616 572 647 673 518 116 444 750 720 616 572 647 678 116 444 859 826 346 246 196 220 195 185 185 57 88 60 48 44 47 46 46 48 Nil Nil Nil Na 26 329 329 329 329 229 229 268 240 224 230 219 213 193 174 168 44 42 40 46 46 46 46 49 1718 667 667 591 527 540 491 459 406 824 822 820 825 829 172 828 82 72 118 111 107 103 111 95 43 82 118 111 107 103 111 95 57 84 85 115 91 91 97 95 105 94	Vet fnc.	10.4	23.6	22.2	28.3	23.8	22.0	19.8	19.7	15.9	16.9
1100 1049 820 886 810 757 689 657 587 794 134 719 515 619 623 508 716 444 759 720 616 572 547 612 508 7116 444 759 720 616 572 547 515 768 716 446 894 750 720 819 612 512 512 518 716 444 894 750 720 814 75 515 75 616 72 919 710 710 710 710 710 710 710 710 710 710	Balance Sheet & Other Fit	n. Date (M	(fillon \$)				i				
794 134 719 519 567 623 508 716 444 750 720 616 572 647 515 476 446 394 859 826 346 246 196 220 195 185 185 8 Nil Nil Nil 642 730 710 780 840 230 286 240 254 329 329 329 79 718 657 667 591 521 193 194 44 824 822 800 801 809 822 828 820 825 R Prop. 59 63 72 85 77 74 75 75 R Prop. 59 63 72 85 77 74 75 R Prop. 59 63 72 85 77 74 75 R Prop. 59 63 72 85 77 74 75 R Prop. 59 63 72 85 77 74 75 R Prop. 59 63 72 85 77 74 75 R Prop. 50 63 115 191 107 103 111 95 S Prop. 50 63 115 91 94 97 95 105 94	Gross Prop.	1,100	1,049	850	928	910	757	669	657	28.7	2
750 720 616 572 547 515 476 446 394 359 326 346 246 196 220 195 185 165 77 58 60 48 44 47 46 47 46 Nil Nil Nil 642 730 710 780 840 230 258 240 234 290 219 313 32 9 79 718 657 667 591 527 540 491 459 406 RPOD. 59 63 72 118 111 107 103 111 95 824 822 820 821 825 627 825 83 72 118 111 107 103 111 95 75 640 491 95 115 101 107 103 111 95 75 75 75 76 75 75 77 75 75 77 75 75 78	Sap. Exp.	79.4	134	71.9	51.9	26.7	62.3	50.8	71.6	44.4	31.4
359 326 346 246 196 220 195 185 185 57 58 60 48 44 47 46 47 49 185 185 185 57 58 60 48 148 47 46 47 49 185 185 185 185 185 185 185 185 185 185	Vet Prop.	35	72	616	572	2,	515	476	446	394	367
S56 326 346 246 196 195	Capitalization:										
NI NI NI 642 7.30 7.10 7.80 8.40 2.20 3.20 3.20 3.20 3.20 3.20 3.20 3.2	LT Oebt	88	88	8	246	2	550	36	. 85	165	-
NI NI NI 32 6 32 9 32 9 32 9 79 NI NI NI 642 730 710 780 840 230 288 240 234 230 219 213 193 174 188 On 43 42 40 45 49 46 46 44 49 718 657 667 591 527 540 491 459 406 Halto 824 822 80.0 80.1 80.9 822 828 82.0 826 1 On Revs. 59 9.1 92 118 11.1 107 10.3 111 95 An Invest Capity 4.1 10.0 9.0 115 99 97 95 106 944	% LT Debt	57	ß	8	8	\$	47	46	47	49	46
On Holy Mil 642 730 710 780 840 2.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1	Płd	Ž	ž	Ž	32.6	88	33	35.9	32.9	6.	7.9
on 43 42 240 254 250 219 213 174 168 189 189 177 189 189 177 189 189 177 189 189 189 177 189 189 189 189 189 189 189 189 189 189	% Ptd.	Ž	Ž	Ī	6.42	23	7.10	7.80	8.40	2.30	2.50
on 43 42 40 45 49 46 44 49 718 657 667 591 527 540 491 459 406 fallo 82.4 82 80 80 82 82 406 n Net Prop. 59 63 7.2 8.5 7.7 7.4 7.2 7.7 An Invest. Capital 31 92 11.8 11.1 107 10.3 11 95 An Corn. Equity 4.1 10.0 90 11.5 99 97 95 106 94	Common	268	240	234	230	219	213	193	174	89	163
And the following series of th	% Common	43	3	40	45	49	46	46	4	49	22
92.4 82.2 80.0 80.1 80.9 82.2 82.8 82.0 82.6 pp. 5.9 6.9 7.2 85 7.7 7.4 72 76 77 7.5 3.9 9.1 9.2 11.8 11.1 10.7 10.3 11.1 9.5 3.0 0.0 11.5 9.9 9.7 9.5 10.6 9.4 5.0 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5	Total Cap.	718	657	667	591	527	₹ 9	491	459	406	376
90. 59 6.9 7.2 85 7.7 7.4 7.2 7.6 7.7 7.4 2.2 7.6 7.7 2.3 3.9 9.1 9.2 11.8 11.1 10.7 10.3 11.1 9.5 2.3 3.0 11.1 9.5 11.1 9.5 11.1 9.5 11.1 9.5 11.1 9.5 11.1 9.5 11.1 9.5 11.1 9.5 11.5 9.9 9.7 9.5 11.5 9.4	% Oper, Ratio	82.4	82.2	90.0	1.08	80.9	62.2	82.8	85.0	82.6	90.0
3.9 9.1 9.2 11.8 11.1 10.7 10.3 11.1 9.5 2.apin 7.1 7.9 6.8 11.2 10.1 9.4 70 7.5 7.5 7.5 (2duly 4.1 10.0 9.0 11.5 9.9 9.7 9.5 10.6 9.4	% Eam. on Net Prop.	5.9	6.9	7.2	8.5	7.7	7.4	7.2	9.7	7.7	8.3
7.9 6.8 11.2 10.1 9.4 7.0 7.5 7.5 10.0 10.0 9.0 11.5 9.9 97 9.5 10.6 9.4	% Return On Revs.	3.9	9.1	9.2	11.8	1.1	10.7	10.3	11.1	9.5	11.2
10.0 9.0 11.5 9.9 9.7 9.5 10.6 9.4	& Return On Invest. Capital	7.1	7.9	6.9	11.2	10.1	4.	2.0	7.5	7.5	80
	& Refurn On Corn. Equity	1.4	10.0	9.0	11.5	6	6	9.5	10.6	9.6	10.3

Office—PDZ Jopin, MD 64801, Tel—(417) 825-5100. Webelle—http://www.empiredsinct.com Pres & CEO—W L Gebon VP-Fin—G A, Knopp Seby, Three & frivestor Contect—Jorda S, Walson (417-55-5100 at 2220) brita—N F. Chubb J., W L Gisson, R. D. Hammous, R. C. Haribey, J. Herschand, F. E. Jeffres, R. L. Lamb, J. S. Leon, M. W. McKinney, M. M. Poczar. Transfer Agent & Registrat—Meleon Investor Services, South Hackenbach, NJ. Incorporated—in Kansas in 1999. Empt— 616, 38P Analyst: Michael Infancy/CB Data as only eput, Left results of des operationer, illems. Per strem data ed, for sik, divs. Bodd denotes dataed EPS (FASB 128) prior periods restated. E-Estimated. NA-Not Analtable. NA-Not Meaningful. NR-Not Planked.

Itam 20, page 15

FPL Group

STICK REPORTS

30-NOV-02 Sub-Industry:

10 Week Mov. Avg. 30 Week Mov. Avg. Relative Strength Yietd • 3.9% 12-Mo. P/E • 21.8 Price As Of 11/29/02 • 58.80 52 Wk Hange • 65.31-45 2000 S&P Opinion: Accumulate (* * * **) • Neutral since 11/02 Ref. Strength Rank (11.0west-99 Highest) 1 Lowest -- 5 Highest) Eam./Div. Rank Quantitative Evaluations Fechnical Eval Insider Activity Fair Value Outbook 58.20 • Low H.X ķ

Overview - 16-SEP-02

28

Operating EPS should grow about 2% in 2002, reflecting a modest uncrease at Florida Power & Light, about 12% growth at FPL. Energy, and more shares outstand 12% growth at FPL. Energy, and more shares outstand ing in March 2002, the Florida Public Service Commusion approved an agreement that neduced (effective April 15, 2002) annual retail rates by \$250 million. Florida Power & Light is adding about 1,500 megawarts of generating capacity in 2002 and around 1,300 megawarts of generating capacity in 2002 and around 1,300 megawarts of generating capacity in 2002 and around 1,300 megawarts of generating capacity at two existing plants in 2003, with completion expected by 2005. FL's perchip adquisition of an 88.2% interest in the New Hampshire-based Seabrook nuclear facility (an New Hampshire-based Seabrook nuclear facility (an of 2002, be modestly accretive in 2003, and add 45 \$0.10 to \$0.12 a share for the following three years.

E0.70 0.580 0.580 0.580 0.580 We would accumulate FPL shares. The stock was recently down about 8% in 2002 (compared to a nearly 20% decline for the S&P Index of Electric Utilities), as at the earlier removal of uncertainty related to the March approval of a rate case agreement was offset by the impact of reduced EPS projections for 2002 and 2003. This follows a 21.4% decline in 2001 (compared to an It 8% decline for the index), when the stock was furthen the stock was furthen the profession of the Entire a consolidation of the index), and wasdeness of the wholeseal power market. Over the long ferm, we expect EPS growth to average around 7% and for the dividend (recently yielding 4.5%), to be increased at an annual rate of about 3% to 4% at 10X to 11X our 2003 EPS estimate of 6.4% 41.0X to 11X our 2003 EPS estimate of 6.4% 455, the stock remains attractive for total return.

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In S&P 500 Summary: This electric utility holding company for Florida Power & Light Co. terminated its merger agreement with Entergy Corp. in April 2001. 8 50 Earnings vs. Previous Year A=Lp V=Down ≫-No Change

\$ 2002

39,319 \$ 10.7 64% Value of \$10,000 invested 5 years ago; \$ 12,755 Tang, Bk. Value/Share Beta Shareholders Market cap. (8) Inst. holdings 1.048 Key Stock Statistics S&P EPS Est 2002 4.7 P/F on S&P Est 2002 12 S&P EPS Est 2003 4.8 Dividend Fate/Share 2.3 Shs. bulstg. (M) Avg. daily vol. (M)

1,587 1,859 1,478 1,369 88.5 <u>\$</u> 1,412 1,614 1,892 1,520 5,438 1,468 1,670 2,087 1,857 7,082 Fiscal Year Ending Dec. 31 2,166 2,529 1,839 8,475 1.843 2.248 2.353 506 506

0.58 0.95 1.52 0.52 3.57 Psyment Date Dividend Data (Dividends have been paid since 1944.) 0.63 1.02 3.85 3.85 Next samings report expected: mid January Stock of Ex-DN.

88.5 8.5 8. 5.4 5.5

Jun. 17 '02 Sep. 16 '02 Dec. 16 '02 Mar. 15 '02 Feb. 22 Jun. 07 Aug. 30 Nov. 29 Feb. 20 Jun. 05 Aug. 28 Nov. 26 Feb. 11 May. 29 Aug. 16 Oct. 18

FPL Group, Inc.

STOCK REPORTS

NYSE Symbol FPL

Business Summary - 16-SEP-02

FPL Group is the holding company for Florida Power &

Light Company and FPL Group Capital.

Florida Power & Light Company ion Fortice rower as Light Company provides electricity to about 3.9 million customer accounts in an area covening in early all of Florida's eastern seaboard, as well as the neady all of Florida's eastern seaboard, as well as the neady all of Florida's eastern seaboard, as well as the neady all of Florida's eastern seaboard, as well as the neady customer class in 2001 were: residential, 56%, 55%, in 2000, 55% in 2000, 45% in 2001 were: residential, 56%, 57%; in 2000, 55% in 1999, commercial, 39%, 65%, 57%; in 2000 why and two at St. Lucle.

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approved a three-year agreement between Florida in a \$350 million reduction in annual revenue, and a revenue state multiple Counsel, resulting life wenue straining mechanism whereby two-thirids of retail rease revenues beyond a threshold (from \$3.4 billion in first year to \$3.5 billion in third year) and 100% of revenues beyond a threshold (from \$3.6 billion to a \$3.6 billion to the beyond a second threshold (from \$3.56 billion to a \$3.6 billion) would be refunded to customers.

FPL s non-utility operations. In January 1998, it formed FPL Energy, to manage existing non-regulated investments and to pursue new investments in the domestic and international energy markets.

As of December 31, 2001, FPL Energy had ownership interest in operating independent power projects with a nel generating capacity of 5,063 negawatts. Fuel sources for these projects in 2001 were natural gas, 45%, wind, 28%, oii, 15%, hydro, 7%, and other, 4%, FPL Energy's capital expenditures in 2001 were about \$1.98 billion, versue \$507 million in 2000 and \$1.54 billion in 1999, it expects to add 1,000 to 2000 megawatts (may) of new wind generating by the end of 2003, it also plans to compele the construction of 8 other plants (with a capacity of about 5,000 mw), which would bring it will be appending sepactly to around 11,000 to 12,000 mw by the end of 2004.

In January 2000, FPL formed FPL Ebserhest through the transfer of its existing 1,600 miles of fiber-optic lines. As of December 31, 2001, the network consisted of 8bout 5,500 route miles. The unit selfs its capacity to FPL, and to customers that include bilephore, cable felevision, internet, and other telecommunications

Semention

In April 2001, FPL agreed to terminate a merger agreement (announced on July 31, 2000) with New Orleans-based Entergy Corp. (ETR).

Per Share Deta (5)										
(Year Ended Dec. 51)	1002	2000	15.39	1998	1997	986	1995	1991	1993	1992
fangible 8k. Val.	34.18	31.78	30.00	28.32	29.62	24.61	24.06	22.50	21.58	19.84
Eamings	4.62	4.14	4.07	3.85	3.57	3.33	3.16	2.91	5	2.65
Dividends	2.24	2.16	5.08	5.00	1.92	2	1.76	88	2.47	2.43
Payout Ratio	48%	25%	51%	25%	54%	25%	%9 <u>5</u>	65%	107%	95%
Prices - High	71.62	23.00	61.93	72.56	60.00	48.12	46.50	39.12	41.00	38.37
- Low	51.21	36.37	41.12	26.06	42.62	41.50	8.8	26.87	35.50	32,00
P/E Ratio - High	16	80	15	<u>6</u>	17	4	5	5	18	-
- Low	=	6	40	15	12	. 12	=	6	ħ	: ₽
Income Statement Analysis (Million	is (Million	ŝ								
Revs.	8,475	7,082	6,438	6.661	6989	6.037	5.592	5.423	5.316	5 193
Depr.	983	1,032	0,040	1.284	100	96	918	7	508	45.4
Maint.	V.	ž	¥ Z	Ϋ́	ž	ž	Ž	ž	347	358
Fxd. Chgs. Cov.	4.5	4.5	5.0	ž	4.0	4.0	3.6	3.2	30	3
Constr. Credits	ž	Ž	₹	Ē	ž	2.0	15.0	24.0	66.2	57.8
Eff. Tax Rate	33%	88	35%	30%	33%	34%	37%	37%	37%	36%
Net Inc.	781	704	697	664	618	579	553	518	429	467
Balance Sheet & Other Fin.	n. Data (Million \$)	Illion \$)								
Gross Prop.	23.388	21,022	19,554	17,952	17.820	17.034	16,725	16,390	15.881	14 972
Cap. Exp.	1544	1,299	961	617	55	88	671	96	1,248	1270
Vet Prop.	11,662	9,934	9,264	8,555	9,354	9,384	9,852	10,203	10,289	9,866
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& Common	'n	25	20	29	90	57	Ŋ	40	47	4
otal Cap.	12.629	1,42	10,337	9,159	9,493	10,201	10,299	10,917	10,722	10,732
% Oper. Ratio	97.6	86.3	0.88	85.4	85.5	85.5	84.5	84.5	86.4	85.1
	10.3	12.9	18.2	14.0	13.1	9.3	11.9	8.2	7.2	6
Return On Rev	Q Ci	6.6	10.8	10.0	9.7	9.6	6.6	9.6	1.8	9.0
	9.6	9.7	11.4	10.7	4.0	8.5	ž	7.8	7.0	8.0
% Return On Corn. Equity	13.5	12.8	13.3	13.3	13.1	12.9	12.9	12.5	40.8	13.0

Data as ong reptit, tief rasults of dass operatipes. Name Per share data agi, for str. divs. Boid denotes dataed EPS (FASB 128)-prior periods restated. E-Estimated INA-Not Available. NAMot Maeningful. NH-Not Hanked.

Office—700 Universe Blvd. Jund Geach, FL 33408. Tet—1661) 694-4000. Website—Hip./www.lpl.com Chran. Pres. & CEO—L, Hey III. VP-Fin. & CEO—A. P. Dewinstis, Secy—D. P. Coyle, Investor Confact—Lisa Kuzel (561-694-4697). Dire—H. J. Americ, S. S. Barrat, R. M. Beall II. J. H. Brown. A. M. Cokine, W. D. Dover, A. W. Drejvice, Jr., P. J. Evarson, L. Hey, III. F. V. Masik, P. R. Tregurna, F. G. Zarb, Transfer Agent & Registran—Equicono, Providence, Ri Incorporated—ir Fonde in 1925; reincorporated in Fonde in 1984. Empi—10.992. S&P Analyst: Justin McCampTN

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STOCK REPORTS

30-NOV-02 Sub-Industry:

Summary: The principal subsidiary of this public utility holding company is Madison (as & Electric, which generates and distributes electricity and distributes natural gas in Wisconsin.

NASDAQ Symbol MGEE

MGE Energy

Fair Value NA Fair Value NA Fair Value NA Fair Value NA Fair Value NA Fair Value NA Fair Value NA Fair Value A Fair Value		7. Wk Hange + 30 14.94 58	30 14	5 5	2 2	7.640 = 5.0% 12-Mo, P/E = 14.5	. 146			#4	printing vs. Pre-		AND CHANGE
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Business Profile - 23-SEP-02

in August. Madison Gas & Electric adopted the holding Dwissian to what each common share sechanged share to what he is the kip. Min. common shares had also the manufactural behavior that he intending company shructure will be it may be in the intending narivals in order to build and own new power plants to meet customer needs. It plans to continue to focus on the utility busineeds. It plans to continue to focus on the utility business in its focus communities. Also in August in directors raised the quarterly dividend to 8%, to \$0.335.9 a share from \$0.333, with the September 15 payment. MadEE has increased its dividend in each of the past 32 years. Refective January 1, 2002, the Public Service Commission of Wisconsin (PSCW) authorized the company to increase electric rates by 5.7%, and gas rates by 0.6%, at

Operational Review - 23-SEP-02

Total operating revenues in the first half of 2002 declined 10%, year to year. Profitability benefited from the figure that costs for electric generation, due to the 64-citien matural gas costs; and from lower interest rates and reduced short-term debt levels. Net income additionance 32 %, 10% \$150 million (\$0.90) Results in the 2001 period exclude a special charge of \$0.01 is in the 2001 period exclude a special charge of \$0.01 is change

Stock Performance - 29-NOV-02

in the past 30 trading days, MGEE's shares have increased 3°s, compared to a 6% rise in the S&P 500. Average trading volume for the past five days was 12.669 shares, conjected with the 40-day moving average of 10 75th shares.

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A Division of The McGraw-HIB Companies

· · · Value of \$10,000 invested 5 years ago; \$ 17,862

Flecal Year Ending Dec. 31 202 2001 2000 94.54 71.98 103.4 324.1

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STOCK REPORTS

30-NOV-02

Sub-Industry: Electric Utilities

In S&P MidCap 400 NYSE Symbol PNM

Summary: This company operates electric and gas utilities in New Mexico through Public Service Company of New Mexico, and selfa wholesale power in the western U.S. Week Mov. Avg. Week Mov. Avg. Ylekt = 3.7% 12-Mo. P/E = 16.2 Ťì. Price As Of 11/29/02 • 23.60 52 Wk Hange • 30.76-17.25 Buillsh since 10/02 Rel. Strength Rank (1 Lowest -- 99 Highest) Fatir 35tv Bank • ■ Outlook rt Lowest 5 High Technical Eval Insider Activity **Quantitative Evaluations** Fair Value • 26.40 Risk · Average

8 8

Business Profile - 16-JUL-02

In July, PNM said continued weaknese in the wholesale power market had led it to reduce its 2002 EPS eathmate. The company projected operating EPS of \$1.90 to \$2.10 for the full year, with soored quarter EPS of about \$0.25. Several factors, including an abundance of available hydropower from the Pactic Northwest, cooler weather through May and June to weather through May and June to weather through May and June to we make the project of a number of new generating plants coming on line, and a confinited slowdown in the regional economy all constituted to holding down power prices in 2002. To preserve its financial position, PNM intends to control expenses and time raplast spending. Construction evilonishing the property of anytomistic of the property

Operational Review - 16-JUL-02

clined 57%, year 10 year, as electric and gas revenues tell 63% and 43%, respectively. Profitability was hurt by a weak regional economy and mild weather in the west; a weak regional economy and mild weather in the west; a weak regional economy and mild weather in the west; a met U.S. that reduced prices for power well below the 2004 level. Wholeseale revenues averaged 524 par.

The absence of homeocuring losses that reduced EPS by 50. Bs net insome dropped 61%, to \$24.9 million (\$0.53.8 a shade, after preferred dividends), from \$63.6 and million (\$1.60). Total operating revenues in the first quarter of 2002 de-

Stock Performance - 29-NOV-02

In the past 30 trading days. PNMs shares have in-creased 16%, compared to a 6% rise in the S&P 5 Average trading estimate for the past five days was 197.25 shares, compared with the 40-day moving erage of 227.357 shares.

Pris vapuri e fur nitrimatirus tempseae and should not be considered a solicitation to buy or sell any security. Parties SEL from any return parting paramitee its accountry or make warmanee negacing require from its usage. Destendation is prohibited without written permission. Copyright to 2002.

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Value of \$10,000 invested 5 years ago; \$ 13,870 Flecal Year Ending Dec. 31

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Progress Energy

NYSE Symbol PGIV

in S&P 500

in S&P 50.

Summary: This holding company was renamed after the acquisition of St. Petersburg-based Florida Progress Corp. by Rateigh-based CP8L Energy.

Sub-Industry: Electric Utilities

STOCK REPORTS 30-NOV-02

45 Ŝ 38 ဗ္တ ŏ₹ 2002 OPTIONS: ASE, P. PI 10 Week Mov. Avg. 30 Week Mov. Avg. Relative Strength LOUGHELLINGER THE RESERVE OF THE STATE OF TH Yield • 5.2% 12-Mo. P/E • 29.2 2001 52 Wk Range • 52.70-32.84 Price As Ot 11/29/02 • 42 1999 S&P Opinion: Hold (* * *) Bearish since 11/02 owest -- 5 Highest) Ref. Strength Rank Earn./Div. Rank Technical Eval. Insider Activity Quantitative Evaluations Fair Value · Average • Neutral Outlook 40.70 Hisk

Anie an enrugated 1.0 s auxonia in Lova Spealing Signer (from 2001 operating EPS of \$3.40), we expect FPS from 2003. Our operating EPS estimate for 2002 includes about \$6.15 to from the elimination of goodwill amontization. But does not include a print quarter \$1.04 wintedown of the company's telecommunications investments. The sale of North Caronian Natural Cas is expected to Cose in mic-2003, with nel proceeds to be used to pay down debt. Tax adjust FPS \$6.25 to \$6.25 to fine company subsequently changed by \$0.27 to the second quarter of 2002, but this will be reversed by the end of the year. With the exquentity changed its name from CP&L Energy to Progress the company. PGN more than doubted its customer of server of the year will be reversed by \$0.27 to fine on an annual revenues to your \$8.40 to \$6.2002, but this will be reversed by the end of the year. With the pages Energy). PGN more than doubted its customer and server of the proceeding capacity). Figure 2002 to the process Energy of the process Energy of the process of the process Energy of the process of the pr After an anticipated 15% advance in 2002 operating

Valuation - 24-OCT-02

2002, they had performed relatively well in comparison to a far steeper decline for their electric utility peers. In fact, the stock has outperformed industry peers since the beginning of 2000. With net proceeds from the sale of North Carolina Natural Cas being used to reduce its debt. PGN is intent on strengthening its behance sheet and maintaining a soul investment grade credit rating. Since it has only a fight maturity schedule over the next. lew years, it will probably not need to issue any addi-lional forgleom eabt. With the strock trading at about 10X our 20X3 operating EPS estimate of \$4.05, we ex-pect only modest price appreciation for the shares. Although the shares were recently down about 10% in However, with the dividend (expected to grow at an annual rate of about 3%) yielding over 5%, the stock is attractive for income-oriented investors.

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A CARLOS OF THE

79,058 \$ 9.3 \$ 9.3 Tang. Blk. Value/Share Shareholders Market cap. (B) Inst. holdings 3.90 10.8 3.85 2.18 222.2 Stock Statistics Key Stock Statistic S&P EPS Est. 2002 P/F on S&P Est 2003 S&P EPS Est. 2003 Dividend Reta/Share Shs. outsig. (M) Avg. daily vol. (M)

Value of \$10,000 invested 5 years ago: \$ 14,456

Fiscal	i Year	Ending D	Jec. 31			
	2002	2001	2000	1999	1996	1987
Reven	the (M)	ition S)				
ō	1.888		1.778	762.9	752.3	716.1
g	2,038		892.3	762.8	7.36.1	0.999
2	2,353	2,331	1.084	1,025	9462	906
ģ	i	1,907	582	806.1	695.4	135
_	i	8,461	4,119	3,358	3,130	3,024
amln	gs Per	Share (5)				
o	0.62	0.77	0.56	0.63	99:0	0.56
ø	8	99.0	0.70	0.43	0,45	0.37
ģ	0.70	1.77	8:	0.97	128	1.15
Q	E0.77	-0.45	-0.07	0.51	0.42	0.58
ني	E3.90	2.68	3.03	2.55	2.75	2.66

Dividend Data (Dividends have been paid since 1937.) Next earnings report expected: late January EX-OV. 200 Amount

Date	Feb. 01 '02	May 01 02	Aug. 01 '02	Nov 01 02
Record	Jan. 10	Apr. 10	Jul. 10	00
Date	Jan. 08	Apr. 08	Jul. 08	80
Decl.	Dec. 12	Mar. 20	May. 08	Sec. 20
9	0.545	0.545	0.545	0.545

STOCK REPORTS

Progress Energy, Inc.

Business Summary - 24-0CT-02

The company flormerly CP&L Energy, changed its name to Progress Energy, inc., in December 2000.

On November 30, 2000, the company acquired Florida Progress Corp. (FPC) for about \$5.4 billion in cash of Res, and stock (35%,) plus the assumption of \$2.7 billion of FPC debt. FPC is the holding company for Florida Power, which provides electricity to 1.4 million customers in central northern and Gulf Coast Florida. CP&L Energy was formed on June 20, 2000, as the holding company for Carolina Power & Light Co. (now operating as CP&L), a utility providing electricity to 1.3 in an and central South Carolina Power & Light Co. (now operating as CP&L), a utility providing electricity to 1.3 in an and central South Carolina, and, after the July 1999 acquisition of North Carolina Natural Gas (through the nort to sell broth Carolina Passuers of about \$3.54 million in stock), natural gas to 176,000 customers in eastern and southern North Carolina and central Power & Light and Florida Power & Company was organized into five primary units: Energy Delivery, Refloring and system planning: Progress Ventures, which system planning: Progress Ventures.

in 2001, the electric operations accounted for 77.5% of PGN's consolidated revenues; the diversified businesses, 18.7%; and the natural gas operations, 3.8%. Carolina Power & Light received authorization from the North Carolina Unity Commission (in December 1996) and the South Carolina Public Service Commission (in January 1999) to accelerate the amortization of its nuclear generating assets, effective from January 1, 2000, Irricugh 2004. Annual amortization will range from \$106 million to \$150 million, for a total of \$750 million. is involved in merchant generation ownership, wholesale energy marketing and trading operation, and fuel extraction, manufacturing and delivering. Energy Services, which oversees NCNG and energy management services, and a Service Company to support the com-

The company's subsidiaries include Progress Telecom, as super-regional carrier with a network that stretches across live states, from New York to Miami, FL, with galeways to Latin America; Caronet, which provides fin galeways to Latin America; Caronet, which provides fin Ber optic Leecommunications earches, and Progress Rai Services, which supplies railined and transit system products and services. PGN also has a 100% interest in Strategic Resource Soutions (SRS), which specializes in facilities and energy management software.

(Year Ended Dec. 31)	2001	2000	1999	1998	1997	1996	1995	1884	1993	1992
Tangible Bk. Val.	10.58	7.48	19.43	19.20	18 18	17.16	16.36	75.05	15 86	16.36
Earnings	2.64	3.03	2.55	2.75	2 66	266	2.48	9 6	25.0	2 6
Dividends	2.12	5.06	5.00	9	1 88	6	7.	2	5 5	2 2
Payout Ratio	%08	%89	78%	71%	71%	%89	71%	84%	78%	707.6
Prices - High	49.25	49.37	47.87	49.62	42.68	38.75	34 62	30.00	\ \frac{\frac{2}{3}}{3}	28.18
- Low	38.78	28.25	29.25	39.18	32.75	33.75	26.12	22.50	27.00	24 43
P/E Ratio - High	19	16	19	18	16	5	4	15	16	12
- Low	15	On I	=	14	12	<u>ნ</u>	Ξ	; =	5	! 2
Income Statement Analysis (Million	sis (Millior	(\$								
Revs.	8,461	4,119	3,358	3.130	3.024	2 906	3.007	2877	200.0	727.0
Depr.	060,	740	496	487	482	387	25	9	414	, g
Mainf.	₹ Z	ď	ž	Ϋ́	¥2	Ž	167	202	8	248
Fxd. Chgs. Cov.	1.8	5.6	4.2	5,5	4.3	4	3.7	3.4	5	
Constr. Credits	18.0	20.7	<u>=</u>	6.8	4.9	6.4	8.5	5	15.0	150
Eff. Tax Hate	ž	30%	40%	39%	38%	41%	36%	35%	32%	37%
Net Inc.	542	478	382	399	388	391	373	313	346	30
Balance Sheet & Other Fin.		Data (Million \$)								
Gross Prop	22.541	21 (2)	12 290	10,797	10 475	10.197	9.822	9.546	633	9 05B
cap. Exp.	1,216	950	99.	527	450	457	344	30	380	334
Vet Prop.	12,445	11,677	7,257	6,300	6,294	6.400	6.329	6.349	643	6.426
Sapitalization:							!	· :	1	
LT Debt	9,577	5,983	3,029	2,614	2,416	2,526	2,610	2,531	2.585	2.675
% LT Debt	61	25	47	46	46	47	4	3	4	20
7.0.	Ž	Ž	59.4	59.4	59.4	14	144	144	1	4
.% Fd.	Ž	Ž	0.91	90	1.10	2.70	2.70	2.70	2.70	2.70
Common	6,004	5,424	3,413	2,949	2,819	2,690	2,575	2,586	2,632	2.53
% Common	36	48	25	25	53	20	48	49	49	47
lotal Cap.	17,241	13,476	8,337	7,514	7,239	7,420	7,288	7 141	7,210	6,673
% Oper. Ratio	83.5	87.1	82.4	79.3	90.6	85.8	82.3	84.7	83.8	BO 4
% Earn, on Net Prop.	10.3	7.6	12.1	10.2	9.9	8	90	7.0	7.3	4
	6.4	11.6	4.7	12.8	12.8	13.1	12.4	10.9	12.0	13.7
Return On Invest.	9.5	7.1	7.3	7.8	7.7	7.8	8.0	7.1	60	6
% Return On Com Equity	9.4	0.0	1.0	127	4.50			,		1

Ualta as origi repitit, beit results of disc opears'spec, itema. Per shere data adj. for siti, diva. Bold denores dijuted EPS (FASB 128)-prior periods restlimated. NA Not Available. NIA-Not Meaningful. NR-Not Planked.

Office—410 South Withmigton St., Raleigh, NC 27601-1748, Tel.—(919) 546-6111 Website—http://www.progress-energy.com/Chrent, Press & CEO—410 Control—P. M. Scott III. EVP & Seep.—W. D. Johnson. Investor Control—Robert F. Deeman Jr. (919-5467-3434) Dinner—E. B. Bronten, D. Birner, W. Cavanaughill, C. W. Coker, R. L. Daughen, W. D. Friedenk Jr., W. O. McCoy, E. M. McKee, J. H. Multin III. R. A. Nurte, C. A. Salachysts, J. L. Witson, J. G. Wither, Trensfer Agent & Registrar—EquiServe Trust Co., Providence, RI. Incorporated—In North Carolina in 1956 Empt.—15,700. S&P Analyst: Justin McCarin/PMW

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STANDARD & POOR'S

Southern Co.

NYSE Symbol SO

In S&P 500

STOCK REPORTS

Summary: This Atlanta-based energy holding company, which spun off its Mirant subsidiary in April 2001, is one of the largest U.S. elec-ಜ Z = 2 = 4 Yield • 5.2%
Earnings vs. Previous Year
12-Mo. P/E • 14.7
▲=up ▼-Down ┣-tho Chang = 10 Week Mov. Avg 30 Week Mov. Avg. Relative Strength ZĎŎŢ 8 S tricity producers. Price As Of 11/29/02 • 26.16 52 Wk Range • 31,14-22,30 30-NOV-02 Sub-Industry: Ejectric Utilities S&P Opinion: Hold (* * *) Beartah since 11/02 Outlook (1 Lowest—5 Highest) Rel. Strength Rank (1 Lowest - 39 Highest) STOCK REPORTS Eam./Div. Rank Technical Eval. Insider Activity Quantitative Evaluations Fair Value ...

After an anticipated 10% increase in 2002 (from 2001 see 1955 from continuing operations of \$1.61), we expect EPS to increase about 4% in 2003. After the April 2001 seption of Minrari (NYSE: MIR), SO is focusing on its spinorit of Minrari (NYSE: MIR), SO is focusing on its wholesale marketing operations in the Southeast, and its unregulated energy-related retrail businesses. About 35% to 40% of SO's earthings are now seen coming in the first helf of the year, and 60% to 65% in the second half With long-serg contracts reducing risk, the wholesale power unit should be able to double its income of about \$200 million by 2005. Over the same period, annual income from the unregulated retail units is expected to grow five-loid, to about \$50 million. With the outlittes seeiing annual customer growth of 2% and sales 30 growth of 75%, we expect SO to exergage annual EPS growth of more than 5% over the long term, aided by 15% growth for more than 6% over the long term, aided by 15% growth for more than 6% over the long term, aided by 15% growth for more than 6% over the long term, aided by 15% growth for more than 6% over the long term, aided by 15% growth for more than 6% over the long term, aided by 15% growth for more than 6% over the long term, aided by 15% growth for more than 6% over the long term, aided by 15% growth 6% over the long term, aided by 15% growth 6% over the long term, aided by 15% growth 6% over 100 periods of 10% over Valuation - 06-NOV-02

to be the relative predictability of its earnings stream and its strong credit retifing, which are in marked contrast to the problems many of its peers have had. However, while the stock has benefited from SO's low risk profile, we see little upside potential from its current level. At around 16 times our 2003 EPS estimate of \$1.85, the shares are trading at a distinct premum to their peers. Still, the dividend (recently yielding about The stock has outperformed the electric utility sector thus far a 2002. This follows two years in which it per formed roughly in file with its industry peers. The prime reason for SO's peer to date outperformatione appears the the carbon provides a construction of the construction of t

Tany, Bk. Value/Share Shareholders Market cap. (B) inst. holdings 713.5 3.155 Key Stock Statistics S&P EPS Est. 2002 PPE on S&P Est. 2002 S&P EPS Est. 2003 Dividend Rate/Share Shs. outstg. (M) Avg. daily vol. (M)

2002

2000

1999

Value of \$10,000 invested 5 years ago: NA

			į			
	2002	2001	2000	1999	1988 1988	1997
Revenu	188 (M	Non \$)				
ō	2,214	2,270		2.442	2.514	2.585
ଷ	2.631	2,561		2.791	2,913	2,717
Š	3,248	3,165		3,737	3,457	1.07
Ĝ	1	2,200	2,294	2,616	2,519	3,238
۲ć	}	10,200	-	11 585	11,403	12,611
Earning	a Per	Share (\$)				
ō	0.32	0.26	0.38	0.32	0.35	0.28
g	9	0.40	0.52	0.45	0.39	031
8	0,83	0.79	98	0.00	0.74	0.55
å	E0.15	0.16	0.16	0.19	8 0 9	0.38
¥	E1.78	1.61	1.52	1.86	9.	1.42

Next semings report expected: late January

the control of the co					4 1 4 4 4
ever, while the stock has benefited from SO's low risk	Dividend	Data (Divide	ends have be	Dividend Data (Dividends have been paid since 1948.)	1948.)
profile, we see little upside potential from its current	Amount	Dete	Ex-Div.	Stock of	Payment
level. At around 16 times our 2003 EPS estimate of		Dect.	Dete	Record	
\$1.85, the shares are trading at a distinct premium to					
Their pages Still the divideod (recently visibling about					
4 7%) is year, section and with the negatiful ratio /77% of	0.335	Jan. 22	Jan 31	Feb. 04	Mar. 06 '02
ייי אוניו מונים לאונים לאונים	2000			00	100
our 2002 EPS estimate of \$1.78) close to the targeted	3	ADI. 13	MAJ). UZ	on American	30 G
ratio of 75%, income-oriented investors can expect fu-	0.343	建 . 15	Aug. 01	Aug. 05	Sep. 06 '02
ture dividend increases in the 2% to 3% range.	0.343	Oct. 21	Oct. 31	Nov. 04	Dec. 06 '02

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Dec. 06 '02 \$ Š

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The Southern Company

The Southern Company is one of the largest U.S. pro-Business Summary - 06-NOV-02

With nearly 35,000 megawatts of generating capacity, this Atlanta-based utility holding company serves approximately 4 million customers in the Southfeast through five integrated subsidiaries. Atlanta Power, Georgia Power, Gulf Power, Mississippi Power and Sawanata Telectric & Power. The Southern Power subsidiary serves both the utility subsidiaries and the wholesale power market.

On April 2, 2001, the company completed the spinoff of its remaining inferest in Miratia Corp. (IVYEE: MHP). In its October 3, 2000. SO completed an IPO (amnounced in April 2, 2001) at 19.7% of its Southern Energy subsidiary 20 (fernaned Miratia to Jahuary 19, 2001), a global independent power producer with energy marketing and risk of management businesses. Gross proceeds from the IPO the to the company were \$1.47 billion. Mirant has operations in the U.S., Europe and Asia. So So domestic electric revenues by customer class in SO3 va domestic electric revenues by by customer class. In CO31 were: residential, 32.8%, commercial, 30.8%, in Quintal, 22.3%, wholesale, 12.2%, and other, 0.3%. Sources of tuel for the Southern system in 2001 were: coall. 72% (78% in 2000); nuclear, (6% (16%), hydroe-vir electric, 3% (2%) and olighst, 9% (48%).

(SPC), to own, manage and finance wholesale general: mig assets in the Southeast. Energy from SPC's assets was to be marketed to wholesale customers through the Southern Company Generativon and Energy Markething subsets of the 80 to megawaits of generating capacity at December 31, 2001. An additional 3,900 megawaits of generating capacity at December 31, 2001. An additional 3,900 megawaits of generating capacity were under construction, and were expected to be in operation by the end of 2003. The company operates, through subsidianes, 34 hydroelectric generaling stations. A fissal fuel generating stations three nuclear generating stations and five combined cycle/cogeneration stations. SO has projected its construction additions or acquisitions of property during the period 2002 through 2004 at \$2.8 billion in 2004.

SO is also the parent company for a system service company that provides, at cost, specialized service to the parent and its subsidiaries; Southern Telecom, which provides wholesalle fiber optic solutions to telecom-communication providers in the Southeast; Southern Company Energy Solutions, which develops business opportunities related to energy products and services; Southern Communications Services (Southern LINC). which provides digital, wrefess communications services to the five utility subsidiantes, as well as to the general public within the Southeast; and Southern Nuclear, which provides services to Southern Company's nuclear power plants.

Per Share Date (\$)										
(Year Ended Dec. 31)	2001	2000	1999	1998	1997	1996	1995	- 1984	1883	1992
Tancible Bk. Vei	10.87	15.12	6.14	8.77	10.52	12.49	26	12 46	Ϋ́	11.05
Earnings	1.61	2.01	8	1.40	1.42	1.68	1.66	1 25	1.57	.5
Dividends	<u>\$</u>	1,34	÷.	<u></u>	33	1.26	1.22	1.18	1 14	1.10
Payout Ratio	83%	%29	72%	%96 96	95%	75%	%£7.	78%	73%	73%
Prices - High	35.72	35.00	29.62	31.56	26.25	25.87	25.00	22.06	23.62	19.56
· Low	20.89	20.37	22.06	23.93	19.87	21 12	19 37	17.00	18 43	15.18
P/E Ratio - High	8	17	16	23	€	15	15	15	15	13
FOW	13	ō	12	17	14	13	12	1.	12	Ç.

Income Statement Analysis	is (Willion	S								
Revs.	10,155	10.066	1,586	11 403	12.611	10,358	9,180	8,297	8,489	8 073
Depr.	1,173	1,171	1,307	1,539	1,246	966	90	821	793	768
Maint	906	852	945	887	763	782	683	999	653	613
Fxd. Chas. Cov.	33	2.9	2.7	2.6	2.7	38	3.3	33	0 4	58
Coristr, Credits	Ϋ́	Ϋ́	ď	ď Z	200	23.0	25.0	59.0	0.52	22.0
Eff. Tax Rate	33%	37.6	33%	368	43%	40%	36%	39%	35%	37%
Net Inc.	1,119	964	1,276	977	972	1,127	1,103	989	1,002	953
Balance Sheet & Other Fir	. Date (W	Illifon \$)								
Gross Prop.	3 5	35.972	38.620	37,363	8.04A	96.195	33,093	369.06	28.947	27,955
Cap. Exp.	2,617	2,225	5.560	5.005	1,859	1,229	1,401	1,536	44	1.105
Net Prop.	85.08 4	21,622	24.544	24,124	22,110	23,269	23.026	21,117	20,013	16.489
Capitalization:										
LT Debt	10.94	10,457	14,443	13,020	10.274	7,935	908.9	7.593	7.411	7.241
% LT Debt	88	49	9	22	46	43	45	44	£5	45
2	ž	ž	Ž	ž	2,237	1,402	1,432	1432	1,333	1,359
Pid.	ż	ž	ž	ž	10	7 60	7.70	8 30	9.10	8 60
Common	7,984	10,690	9,296	9 797	9,647	9.216	8,772	8.186	7,684	7,234
% Common	54	5	8	ŧ.	4	20	47	48	47	46
Total Cap.	24,147	26,436	29.662	24,790	27 997	24 454	24.877	23.063	22,358	16,791
% Oper. Ratio	61.9	82.0	7.18	82.6	84.6	82.1	79.5	79.3	79.2	78.2
% Earn. on Net Prop.	10.7	1.	8.5	7.3	9.6	8.0	8.5	83	6 7	106
% Return On Revs.	11.0	6.6	11.0	9.8	7.7	10.9	12.0	11.9	11.8	1.8
% Return On Invest. Capital	7.4	7.3	9.6	13.8	10.4	7.8	4.9	7 6	6.9	10.5
% Hetam On Corn Fourity	12.0	10.0	13.4	10.0	10.3	12.5	13.0	125	13.4	13.4

Office—270 Peachiee St. N.W. Alania, GA 30303, Tel—4(404) 508-5000. Website—http://www.southernco.com. Chrimit Pres & CEO—H. A. Frankin, EPP & ECO—C4. E. Klagas Secy—F. Chrishinim, Imrestor Contect—Claim Mordell (404-505-135). Dirs—D. P. Annes D. J. Benn T. F. Chagman, H. A. Frankin, B. S. Gordon, L. G. Hardman HI, D. M. James, Z. T. Patie, G. J. St. Pe Transfer Agent & Registrar—SCS Stochooker, Services. Adams. Registrar—SCS Stochooker, Services. Adams

Rate
Rate of interest in money and capital markets
Federal Reserve System
Long-term or capital market
Government securities
Federal
Constant maturity
One-year
Not seasonally adjusted
Twelve months ending December

YIELDS ON TREASURY SECURITIES AT CONSTANT, FIXED MATURITY ARE CONSTRUCTED BY THE TREASURY DEPARTMENT, BASED ON THE MOST ACTIVELY TRADED MARKETABLE TREASURY SECURITIES. YIELDS ON THESE ISSUES ARE BASED ON COMPOSITE QUOTES REPORTED BY U.S. GOVERNMENT SECURITIES DEALERS TO THE FEDERAL RESERVE BANK OF NEW YORK. TO OBTAIN THE CONSTANT MATURITY YIELDS, PERSONNEL AT TREASURY CONSTRUCT A YIELD CURVE EACH BUSINESS DAY AND YIELD VALUES ARE THEN READ FROM THE CURVE AT FIXED MATURITIES.

Released on 12/22/2003

	tcmly
1962 1963 1964 1965 1966 1967 1968 1969 1971 1973 1975 1977 1978 1977 1981 1983 1984 1985 1988 1988 1989 1990 1991 1992 1993 1994	3.10 3.36 3.85 4.15 5.20 4.88 5.69 7.12 6.88 5.32 6.78 8.34 10.65 12.88 10.95 10.91
1995 1996	5.94 5.52

Itam 20, page 21

1997	5.63
1998	5.05
1999	5.08
2000	6.11
2001	3.49
2002	2.00

Jun 20, page 22
12/26/03 8:37 AM

Responses of the Attorney General's Witness
Carl G. K. Weaver to
Commonwealth of Kentucky PSC Case No. 2003-00334
And Case No. 2003-00335
Louisville Gas and Electric Company's and Kentucky Utilities Company's
Initial Requests for Information

21. In reference to the risk adjustment shown on page 54, line 11, explain in detail how the figures for KU and LG&E were derived. Provide all calculations, data, assumptions, etc. in reaching the conclusions indicated.

Answer:

See testimony, beginning on page 25 and continuing through page 42, line 2. The risk analysis was performed to compare KU and LG&E with the companies selected for obtaining data. Also refer to the testimony, page 52 beginning at line 22 and continuing page 54, line 3. The analysis was used to provide a basis for judging the risk differences and the adjustment needed for determining the cost of equity for KU and LG&E.

Responses of the Attorney General's Witness Carl G. K. Weaver to Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335 Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

22.	Provide the attachment deriving the DCF model for various holding periods discussed at
the bot	tom of page 7 of Dr. Weaver's Appendix II.

Answer:

Attached

Ninth Edition

FINANCIAL MANAGEMENT

THEORY AND PRACTICE

EUGENE F. BRIGHAM University of Florida

LOUIS C. GAPENSKI University of Florida

MICHAEL C. EHRHARDT University of Tennessee



The Dryden Press
Harcourt Brace College Publishers

Fort Worth Philadelphia San Diego New York Orlando Austin San Antonio
Toronto Montreal London Sydney Tokyo

SELF-TEST QUESTIONS Differentiate between a closely held corporation and a publicly owned composition of the contract of the contr

COMMON STOCK VALUATION

Common stock represents an ownership interest in a corporation, but to the investor, a share of common stock is simply a piece of paper characterized features:

- 1. It entitles its owner to dividends, but only if the company has earnings out of dividends can be paid, and only if management chooses to pay dividends rather retaining and reinvesting all the earnings. Whereas a bond contains a promise interest, common stock provides no such promise—if you own a stock, you expect a dividend, but your expectations may not in fact be met. To illustrate Island Lighting Company (LILCO) had paid dividends on its common stock for than 50 years, and people expected those dividends to continue. However, when company encountered severe problems a few years ago, it stopped paying divident would have been declared bankrupt, and the bondholders could potentially taken over the company.
- 2. Stock can be sold at some future date, hopefully at a price greater than the purifying price. If the stock is actually sold at a price above its purchase price, the investigation of the stock is actually sold at a price above its purchase price, the investigation of the stock of the stoc

Definitions of Terms Used in Stock Valuation Models

Common stocks provide an expected future cash flow stream, and a stock's value found in the same manner as the values of other financial assets — namely, as the prent value of the expected future cash flow stream. The expected cash flows consist two elements: (1) the dividends expected in each year and (2) the price investors expector receive when they sell the stock. The expected final stock price includes the return of the original investment plus an expected capital gain.

We saw in Chapter 1 that managers seek to maximize the values of their firm stocks. A manager's actions affect both the stream of income to investors and the risk iness of that stream. Therefore, managers need to know how alternative actions at likely to affect stock prices. At this point we develop some models to help show how the value of a share of stock is determined. We begin by defining the following terms:

 D_t = dividend the stockholder *expects* to receive at the end of Year t. D_0 is the most recent dividend, which has already been paid; D_1 is the first dividend expected, and it will be paid at the end of this year; D_2 is the dividend expected at the end of two years; and so forth. D_1 represents the first cash flow a new purchaser of the stock will receive. Note that D_0 , the dividend which has just been paid, is known with certainty. However, all future division

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dends are expected values, so the estimate of D_t may differ among investors.⁵

 P_0 = actual market price of the stock today.

 \hat{P}_t = expected price of the stock at the end of each Year t (pronounced "P hat t"). \hat{P}_0 is the **intrinsic**, or *theoretical*, **value** of the stock today as seen by the particular investor doing the analysis; \hat{P}_1 is the price expected at the end of one year; and so on. Note that \hat{P}_0 is the intrinsic value of the stock today based on a particular investor's estimate of the stock's expected dividend stream and the riskiness of that stream. Hence, whereas the market price P_0 is fixed and is identical for all investors, \hat{P}_0 could differ among investors depending on how optimistic they are regarding the company. The caret, or "hat," is used to indicate that \hat{P}_t is an estimated value. \hat{P}_0 , the individual investor's estimate of the intrinsic value today, could be above or below P_0 , the current stock price, but an investor would buy the stock only if his or her estimate of \hat{P}_0 were equal to or greater than P_0 .

Since there are many investors in the market, there can be many values for \hat{P}_0 . However, we can think of a group of "average," or "marginal," investors whose actions actually determine the market price. For these marginal investors, P_0 must equal \hat{P}_0 ; otherwise, a disequilibrium would exist, and buying and selling in the market would change P_0 until $P_0 = \hat{P}_0$ for a marginal investor.

- g = expected growth rate in dividends as predicted by a marginal investor. If dividends are expected to grow at a constant rate, g is also equal to the expected rate of growth in earnings and in the stock's price. Different investors may use different g's to evaluate a firm's stock, but the market price, P₀, is set on the basis of the g estimated by marginal investors.
- $k_s=$ minimum acceptable, or **required rate of return**, on the stock, considering both its riskiness and the returns available on other investments. Again, this term generally relates to marginal investors. The determinants of k_s include the real rate of return, expected inflation, and risk premiums, as discussed in Chapter 5.
- $\hat{k}_s =$ expected rate of return which an investor who buys the stock expects to receive. \hat{k}_s (pronounced "k hat s") could be above or below k_s , but one would buy the stock only if \hat{k}_s were equal to or greater than k_s .
- k_s = actual, or realized, after-the-fact rate of return, pronounced "k bar s." You may expect to obtain a return of k_s = 15 percent if you buy Exxon stock today, but if the market goes down, you may end up next year with an actual realized return that is much lower, perhaps even negative.
- D_1/P_0 = expected **dividend yield** on the stock during the coming year. If the stock is expected to pay a dividend of D_1 = \$1 during the next 12 months, and if its current price is P_0 = \$10, then the expected dividend yield is \$1/\$10 = 0.10 = 10%.

⁵Stocks generally pay dividends quarterly, so theoretically we should evaluate them on a quarterly basis. However, in stock valuation, most analysts work on an annual basis because the data generally are not precise enough to warrant refinement to a quarterly model. For additional information on the quarterly model, see Charles M. Linke and J. Kenton Zumwalt, "Estimation Biases in Discounted Cash Flow Analysis of Equity Capital Cost in Rate Regulation," *Financial Management*, Autumn 1984, 15–21.

 $\frac{\hat{P}_1 - P_0}{P_0} = \text{expected capital gains yield on the stock during the coming years stock sells for $10 today, and if it is expected to rise to $10.50 end of one year, then the expected capital gain is <math>\hat{P}_1 - P_0 = \$10.00 = \$0.50$, and the expected capital gains yield is \$0.50.00 = 5%.

Expected = \hat{k}_s = expected dividend yield (D_1/P_0) plus expected capital gains total $[(\hat{P}_1 - P_0)/P_0]$. In our example, the **expected total return** = \hat{k}_s = 10 return

Expected Dividends as the Basis for Stock Values

In our discussion of bonds in Chapter 8, we found the value of a bond as the prevalue of interest payments over the life of the bond plus the present value of the bond plus the bond plus the present value of the bond plus the bond plus the present value of the bond plus the present value of the bond plus the present value of the

$$V_B = \frac{INT}{(1+k_d)^1} + \frac{INT}{(1+k_d)^2} + \dots + \frac{INT}{(1+k_d)^N} + \frac{M}{(1+k_d)^N}.$$

Stock prices are likewise determined as the present value of a stream of cash flows, the basic stock valuation equation is similar to the bond valuation equation. What the cash flows that corporations provide to their stockholders? First, think of yours as an investor who buys a stock with the intention of holding it (in your family) fore. In this case, all that you (and your heirs) will receive is a stream of dividends, and value of the stock today is calculated as the present value of an infinite stream dividends:

Value of stock =
$$\hat{P}_0$$
 = PV of expected future dividends
= $\frac{D_1}{(1+k_s)^1} + \frac{D_2}{(1+k_s)^2} + \cdots + \frac{D_{\infty}}{(1+k_s)^{\infty}}$
= $\sum_{t=1}^{\infty} \frac{D_t}{(1+k_s)^t}$.

What about the more typical case, where you expect to hold the stock for a finite period and then sell it—what will be the value of \hat{P}_0 in this case? Unless the company likely to be liquidated and thus to disappear, the value of the stock is again determined by Equation 9-1. To see this, recognize that for any individual investor, the expected cash flows consist of expected dividends plus the expected sale price of the stock. However, the sale price the current investor receives will depend on the dividends some future investor expects. Therefore, for all present and future investors in total, expected cash flows must be based on expected future dividends. Put another way, unless a firm is liquidated or sold to another concern, the cash flows it provides to its stockholders will consist only of a stream of dividends. Therefore, the value of a share of its stock must be established as the present value of that expected dividend stream.

The general validity of Equation 9-1 can also be confirmed by asking the following question: Suppose I buy a stock and expect to hold it for one year. I will receive dividends during the year plus the value \hat{P}_1 when I sell out at the end of the year. But what will determine the value of \hat{P}_1 ? The answer is that it will be determined as the present value of the dividends expected during Year 2 plus the stock price at the end of that year, which, in turn, will be determined as the present value of another set of future

dividends and an even more distant stock price. This process can be continued ad infinitum, and the ultimate result is Equation 9-1.6

Equation 9-1 is a generalized stock valuation model in the sense that the time pattern of D_t can be anything: D_t can be rising, falling, or constant, it can be fluctuating randomly, or it can even be zero for several years, and Equation 9-1 will still hold. Often, however, the projected stream of dividends is expected to follow a systematic pattern, in which case we can develop a simplified (that is, easier to evaluate) version of the stock valuation model expressed in Equation 9-1. In the following sections, we consider the cases of zero growth, constant growth, and nonconstant growth.

Stock Values with Zero Growth

s yield

Suppose dividends are not expected to grow at all but to remain constant. Here we have a zero growth stock, for which the dividends expected in future years are equal to some constant amount — that is, $D_1 = D_2 = D_3$ and so on. Therefore, we can drop the subscripts on D and rewrite Equation 9-1 as follows:

$$\hat{P}_0 = \frac{D}{(1+k_s)^1} + \frac{D}{(1+k_s)^2} + \dots + \frac{D}{(1+k_s)^{\infty}}.$$
 (9-1a)

As we noted in Chapter 7 in connection with the British consol bond, a security that is expected to pay a constant amount each year forever is called a perpetuity. Therefore, a zero growth stock is a perpetuity.

Although a zero growth stock is expected to provide a constant stream of dividends into the indefinite future, each dividend has a smaller present value than the preceding one, and as the years get very large, the present value of the future dividends approaches zero. To illustrate, suppose D=\$1.15 and $k_s=13.4\%$. We can rewrite Equation 9-1a as follows:

$$\begin{split} \hat{P}_0 &= \frac{\$1.15}{(1.134)^1} + \frac{\$1.15}{(1.134)^2} + \frac{\$1.15}{(1.134)^3} + \dots + \frac{\$1.15}{(1.134)^{50}} + \dots + \frac{\$1.15}{(1.134)^{100}} + \dots \\ &= \$1.01 + \$0.89 + \$0.79 + \dots + \$0.002 + \dots + \$0.000004 + \dots \end{split}$$

We can also show the zero growth stock in graph form, as in Figure 9-1. The horizontal line shows the constant dividend stream, $D_t = \$1.15$. The descending step function curve shows the present value of each future dividend. If we extended the analysis on out to infinity and then summed the present values of all the future dividends, the sum would be equal to the value of the stock.

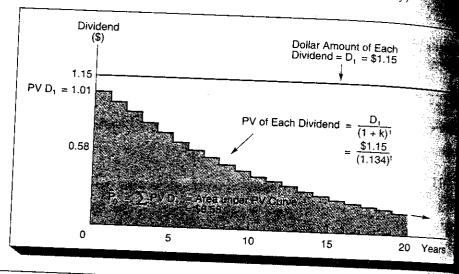
As we saw in Chapter 7, the value of any perpetuity is simply the payment divided by the discount rate, so the value of a zero growth stock reduces to this formula:

$$\hat{P}_0 = \frac{D}{k_s}. ag{9-2}$$

⁶We should note that investors periodically lose sight of the long-run nature of stocks as investments and forget that in order to sell a stock at a profit, one must find a buyer who will pay the higher price. If you analyzed a stock's value in accordance with Equation 9-1, concluded that the stock's market price exceeded a reasonable value, and then bought the stock anyway, then you would be following the "bigger fool" theory of investment—you think that you may be a fool to buy the stock at its excessive price, but you also think that when you get ready to sell it, you can find someone who is an even bigger fool. The bigger fool theory was widely followed in the summer of 1987, just before the stock market lost more than one-third of its value in the October 1987 crash. Many people think it is back in vogue now, in 1998.

FIGURE 9-1

Present Values of Dividends of a Zero Growth Stock (Perpetuity)



Therefore, the value of our illustrative stock is \$8.58:

$$\hat{P}_0 = \frac{\$1.15}{0.134} = \$8.58.$$

If you extended Figure 9-1 on out forever and then added up the present value of each individual dividend, you would end up with the intrinsic value of the stock, \$8.58. The depending on other investors' perceptions of the dividend pattern and riskiness of the stock.

We could transpose the \hat{P}_0 and the k_s in Equation 9-2 and solve for k_s to produce Equation 9-3:

$$\hat{\mathbf{k}}_{s} = \frac{\mathbf{D}}{\mathbf{P}_{0}}.$$

We could then look up the price of the stock and the latest dividend, P_0 and D, in the newspaper, and D/P_0 would be the rate of return we could expect to earn if we bought the stock. Since we are dealing with an *expected rate of return*, we put a "hat" on the k value. Thus, if we bought the stock at a price of \$8.58 and expected to receive a constant dividend of \$1.15, our expected rate of return would be

$$\hat{k}_s = \frac{\$1.15}{\$8.58} = 0.134 = 13.4\%.$$

 $^{^{7}}$ If you think that having a stock pay dividends forever is unrealistic, then think of it as lasting only for 50 years. Here you would have an annuity of \$1.15 per year for 50 years discounted at 13.4 percent. Enter fers by only a penny from that of the perpetuity. Thus, the dividends from Years 51 to infinity contributes almost nothing to the value of the stock.

Normal, or Constant, Growth

Although the zero growth model is applicable to a few companies, the earnings and dividends of most companies are expected to increase over time. Expected growth rates vary from company to company, but dividend growth on average is expected to continue in the foreseeable future at about the same rate as that of the nominal gross domestic product (real GDP plus inflation). On this basis, one might expect the dividend of an average, or "normal," company to grow at a rate of 6 to 8 percent a year. Thus, if a **normal**, or **constant**, **growth** company's last dividend, which has already been paid, was D_0 , its dividend in any future Year t may be forecasted as $D_t = D_0(1 + g)^t$, where g is the constant expected rate of growth. For example, if MicroDrive just paid a dividend of \$1.15 (that is, $D_0 = \$1.15$), and if investors expect an 8 percent growth rate, then the estimated dividend one year hence would be $D_1 = \$1.15(1.08) = \1.24 ; D_2 would be \$1.34; and the estimated dividend five years hence would be

$$D_t = D_0(1+g)^t = \$1.15(1.08)^5 = \$1.69$$
.

Using this method for estimating future dividends, we can determine the current stock value, \hat{P}_0 , using Equation 9-1 as set forth previously—in other words, we can find the expected future cash flow stream (the dividends), then calculate the present value of each dividend payment, and finally sum these present values to find the value of the stock. Thus, the intrinsic value of the stock is equal to the present value of its expected future dividends.

If g is constant, Equation 9-1 may be rewritten as follows:8

$$\begin{split} \hat{P}_0 &= \frac{D_0 (1+g)^1}{(1+k_s)^1} + \frac{D_0 (1+g)^2}{(1+k_s)^2} + \dots + \frac{D_0 (1+g)^\infty}{(1+k_s)^\infty} \\ &= D_0 \sum_{t=1}^\infty \frac{(1+g)^t}{(1+k_s)^t} \\ &= \frac{D_0 (1+g)}{k_s - g} = \frac{D_1}{k_s - g}. \end{split} \tag{9-4}$$

Inserting values into Equation 9-4, we find the value of our illustrative stock to be \$23.00:

$$\hat{P}_0 = \frac{\$1.15(1.08)}{0.134 - 0.08} = \frac{\$1.242}{0.054} = \$23.00.$$

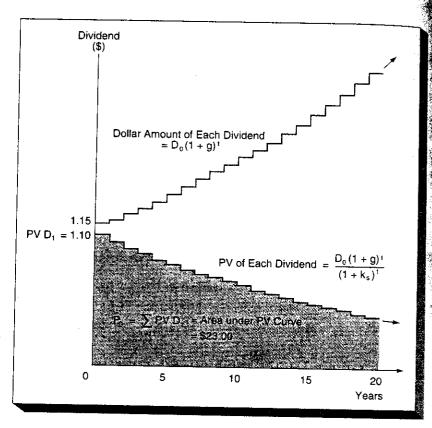
The **constant growth model** as set forth in the last term of Equation 9-4 is often called the Gordon Model, after Myron J. Gordon, who did much to develop and popularize it.

Note that Equation 9-4 is sufficiently general to encompass the zero growth case described earlier: If growth is zero, this is simply a special case of constant growth, and Equation 9-4 is equal to Equation 9-2. Note also that a necessary condition for the derivation of Equation 9-4 is that k_s be greater than g. Look back at the second form of Equation 9-4. If g is larger than k_s , then $(1+g)^t/(1+k_s)^t$ must always be greater than one. In this case, Equation 9-4 is the sum of an infinite number of terms, with each term being a number larger than one. Therefore, if the constant g were greater than k_s , the resulting stock price would be infinite! Since no company is worth an infinite price, it is impossible to have a constant growth rate that is greater than k_s . So, if you try to

⁸The last form of Equation 9-4 is derived in Appendix 4A of Eugene F. Brigham and Louis C. Gapenski, *Intermediate Financial Management*, 5th ed. (Fort Worth, Tex.: Dryden Press, 1996). In essence, Equation 9-4 is the sum of a geometric progression, and the final result is the solution value of the progression.

FIGURE 9-2

Present Values of Dividends of a Constant Growth Stock: $D_0 = \$1.15$, g = 8%, $k_s = 13.4\%$



use the constant growth model in a situation where g is greater than k_s , you will violate laws of economics and mathematics, and your results will be both wrong an meaningless.

The concept underlying the valuation process for a constant growth stock is graphed in Figure 9-2. Dividends are growing at the rate g=8%, but because $k_s>g$, the present value of each future dividend is declining. For example, the dividend in Year 1 is $D_1=D_0(1+g)^1=\$1.15(1.08)=\1.242 . However, the present value of this dividend, discounted at 13.4 percent, is $PV(D_1)=\$1.242/(1.134)^1=\1.095 . The dividend expected in Year 2 grows to \$1.242(1.08)=\$1.341, but the present value of this dividend falls to \$1.04. Continuing, $D_3=\$1.449$ and $PV(D_3)=\$0.993$, and so on. Thus, the expected dividends are growing, but the present value of each successive dividend is declining because the dividend growth rate (8%) is less than the rate used for discounting the dividends to the present (13.4%).

If we summed the present values of each future dividend, this summation would be the value of the stock, \hat{P}_0 . When g is a constant, this summation is equal to $D_1/(k_s-g)$, as shown in Equation 9-4. Therefore, if we extended the lower step function curve in Figure 9-2 on out to infinity and added up the present values of each future dividend, the summation would be identical to the value given by Equation 9-4, \$23.00.

Growth in dividends occurs primarily as a result of growth in earnings per share (EPS). Earnings growth, in turn, results from a number of factors, including (1) infla-

tion, (2) the amount of earnings the company retains and reinvests, and (3) the rate of return the company earns on its equity (ROE). Regarding inflation, if output (in units) is stable, but both sales prices and input costs rise at the inflation rate, then EPS will also grow at the inflation rate. Even without inflation, EPS will also grow as a result of the reinvestment, or plowback, of earnings. If the firm's earnings are not all paid out as dividends (that is, if some fraction of earnings is retained), the dollars of investment behind each share will rise over time, and that should lead to growth in earnings and dividends.

Even though a stock's value is derived from expected dividends, this does not necessarily mean that corporations can increase their stock prices by simply raising the current dividend. Shareholders care about *all* dividends, both current and those expected in the future. Moreover, there is a trade-off between current dividends and future dividends. Companies that pay high current dividends have less money to retain and reinvest in the business, and that lowers the rate of growth in earnings and dividends. So, the issue is this: Do shareholders prefer higher current dividends at the cost of a slower rate of growth in dividends, the reverse, or are stockholders indifferent? As we will see in Chapter 17, there is no simple answer to this question. Shareholders prefer to have the company retain earnings, hence pay less current dividends, if it has highly profitable investment opportunities, but they want the company to pay earnings out if its investment opportunities are poor. Taxes also play a role, as dividends and capital gains are taxed differently, so dividend policy affects investors' taxes. We will consider dividend policy in detail in Chapter 17.

Do Stock Prices Reflect Long-Term or Short-Term Events?

Managers often complain that the stock market is shortsighted and that it cares only about next quarter's performance. Let's use the constant growth model to test this assertion. MicroDrive's most recent dividend was \$1.15, and it is expected to grow at a rate of 8 percent per year. Since we know the growth rate, we can forecast the dividends for each of the next five years and then find their present values:

$$\begin{split} \text{PV} &= \frac{\text{D}_0(1+g)^1}{(1+k_s)^1} + \frac{\text{D}_0(1+g)^2}{(1+k_s)^2} + \frac{\text{D}_0(1+g)^3}{(1+k_s)^3} + \frac{\text{D}_0(1+g)^4}{(1+k_s)^4} + \frac{\text{D}_0(1+g)^5}{(1+k_s)^5} \\ &= \frac{\$1.15(1.08)^1}{(1.134)^1} + \frac{\$1.15(1.08)^2}{(1.134)^2} + \frac{\$1.15(1.08)^3}{(1.134)^3} + \frac{\$1.15(1.08)^4}{(1.134)^4} + \frac{\$1.15(1.08)^5}{(1.134)^5} \\ &= \frac{\$1.242}{(1.134)^1} + \frac{\$1.341}{(1.134)^2} + \frac{\$1.449}{(1.134)^3} + \frac{\$1.565}{(1.134)^4} + \frac{\$1.690}{(1.134)^5} \\ &= 1.095 + 1.043 + 0.993 + 0.946 + 0.901 \\ \approx \$5.00. \end{split}$$

Recall that MicroDrive's stock price is \$23.00. Therefore, only \$5.00, or 22 percent, of the \$23.00 stock price is attributable to short-term cash flows. This means that MicroDrive's managers will have a bigger impact on the stock price if they work to increase long-term cash flows rather than focus on short-term flows. This situation holds for most companies. Indeed, a number of professors and consulting firms have used actual company data to show that more than 80 percent of a typical company's stock price is due to cash flows expected more than five years in the future.

This brings up an interesting question. If most of a stock's value is due to long-term cash flows, why do managers and analysts focus so much attention on quarterly earnings? Part of the answer lies in the information conveyed by short-term earnings. For example, if actual quarterly earnings are lower than expected, not because of

fundamental problems but only because a company has increased its R&D entures, studies have shown that the stock price probably won't decline and may an increase. This makes sense, because R&D should increase future cash flows other hand, if quarterly earnings are lower than expected because customers don't the company's new products, then this new information will have negative implication for future values of g, the long-term growth rate. As we show later in this chapter small changes in g can lead to large changes in stock prices. Therefore, while the terly earnings itself might not be terribly important, the information they convey a future prospects can be terribly important.

Another reason many managers focus on short-term earnings is that some firms managerial bonuses on the basis of current earnings rather than stock prices (where flect future earnings). For these managers, the concern with quarterly earnings due to their effect on stock prices—it's due to current earnings' effect on bonuses.

Expected Rate of Return on a Constant Growth Stock

We can solve Equation 9-4 for k_s , again using the hat to denote that we are dealing an expected rate of return: 10

Thus, if you buy a stock for a price $P_0 = \$23$, and if you expect the stock to pay a didend $D_1 = \$1.242$ one year from now and to grow at a constant rate g = 8% in future, then your expected rate of return will be 13.4 percent:

$$\hat{k}_s = \frac{\$1.242}{\$23} + 8\% = 5.4\% + 8\% = 13.4\%.$$

In this form, we see that \hat{k}_s is the expected total return and that it consists of expected dividend yield, $D_1/P_0 = 5.4\%$, plus an expected growth rate or capital gain yield, g = 8%.

Suppose this analysis had been conducted on January 1, 1999, so $P_0 = \$23$ is the January 1, 1999, stock price, and $D_1 = \$1.242$ is the dividend expected at the end of 1999 What is the expected stock price at the end of 1999? We would again apply Equation 9-4, but this time we would use the year-end dividend, $D_2 = D_1(1 + g) = \$1.242(1.08)$ \$1.3414:

$$\hat{P}_{12/31/99} = \frac{D_{2000}}{k_s - g} = \frac{\$1.3414}{0.134 - 0.08} = \$24.84.$$

Now, notice that \$24.84 is 8 percent greater than P_0 , the \$23 price on January 1, 1999

$$$23(1.08) = $24.84.$$

⁹Many apparent puzzles in finance can be explained either by managerial compensation systems or by peculiar features of the Tax Code. So, if you can't explain a firm's behavior in terms of economic logic, look to bonuses or taxes as possible explanations.

¹⁰The k_s value in Equation 9-4 is a required rate of return, but when we transform to obtain Equation 9-5 we are finding an expected rate of return. The transformation requires that $k_s = \hat{k}_s$, which holds if the stock market is in equilibrium, a condition that will be discussed later in the chapter.

Thus, we would expect to make a capital gain of \$24.84 - \$23.00 = \$1.84 during 1999, which would provide a capital gains yield of 8 percent:

Capital gains yield₁₉₉₉ =
$$\frac{\text{Capital gain}}{\text{Beginning price}} = \frac{\$1.84}{\$23.00} = 0.08 = 8\%.$$

We could extend the analysis on out, and in each future year the expected capital gains yield would always equal g, the expected dividend growth rate.

Continuing, the dividend yield in 2000 could be estimated as follows:

Dividend yield₂₀₀₀ =
$$\frac{D_{2000}}{\hat{P}_{12/31/99}} = \frac{\$1.3414}{\$24.84} = 0.054 = 5.4\%$$
.

The dividend yield for 2001 could also be calculated, and again it would be 5.4 percent. Thus, for a constant growth stock, the following conditions must hold:

- 1. The dividend is expected to grow forever at a constant rate, g.
- 2. The stock price is expected to grow at that same rate.
- The expected dividend yield is a constant.
- 4. The expected capital gains yield is also a constant, and it is equal to g.
- 5. The expected total return, \hat{k}_s , is equal to the expected dividend yield plus the expected growth rate: \hat{k}_s = dividend yield + g.

The term *expected* should be clarified—it means expected in a probabilistic sense, as the statistically expected outcome. Thus, if we say the growth rate is expected to remain constant at 8 percent, we mean that the best prediction for the growth rate in any future year is 8 percent, not that we literally expect the growth rate to be exactly 8 percent in each future year. In this sense, the constant growth assumption is reasonable for many large, mature companies.

Supernormal, or Nonconstant, Growth

Firms typically go through *life cycles*. During the early part of their lives, their growth is much faster than that of the economy as a whole; then they match the economy's growth; and finally their growth is slower than that of the economy. Automobile manufacturers in the 1920s and computer software firms such as Microsoft in the 1990s are examples of firms in the early part of the cycle; these firms are called **supernormal**, or **nonconstant**, **growth** firms. Figure 9-3 illustrates nonconstant growth and also compares it with normal growth, zero growth, and negative growth. ¹²

Itam 22, page 12

¹¹The concept of life cycles could be broadened to *product cycle*, which would include both small startup companies and large companies like Procter & Gamble, which periodically introduce new products that give sales and earnings a boost. We should also mention *business cycles*, which alternately depress and boost sales and profits. The growth rate just after a major new product has been introduced, or just after a firm emerges from the depths of a recession, is likely to be much higher than the "expected long-run average growth rate," which is the proper number for a DCF analysis.

¹²A negative growth rate indicates a declining company. A mining company whose profits are falling because of a declining ore body is an example. Someone buying such a company would expect its earnings, and consequently its dividends and stock price, to decline each year, and this would lead to capital losses rather than capital gains. Obviously, a declining company's stock price will be relatively low, and its dividend yield must be high enough to offset the expected capital loss and still produce a competitive total return. Students sometimes argue that they would not be willing to buy a stock whose price was expected to decline. However, if the annual dividends are large enough to *more than offset* the falling stock price, the stock could still provide a good return.

Responses of the Attorney General's Witness
Carl G. K. Weaver to
Commonwealth of Kentucky PSC Case No. 2003-00334
And Case No. 2003-00335
Louisville Gas and Electric Company's and Kentucky Utilities Company's
Initial Requests for Information

23. Explain why Dr. Weaver uses a 2001-2002 average on Schedules 17-28, but uses a 2000-2002 average on Schedules 29-30.

Answer:

Schedules 17 through 28 are for cash flow risk assessment. Cash flow statements are constructed by taking the difference in asset and liability accounts from one year to the next. Three years of data are needed to prepare two years of cash flows. Schedules 29 and 30 are comparing three years of individual accounts from the income statement and balance sheet.

Responses of the Attorney General's Witness Carl G. K. Weaver to

Commonwealth of Kentucky PSC Case No. 2003-00334 And Case No. 2003-00335

Louisville Gas and Electric Company's and Kentucky Utilities Company's
Initial Requests for Information

- 24. In reference to Schedules 39 and 40:
- a. Explain how the convergence from current growth to growth in 2007 is derived and provide all assumptions and calculations used.
- b. If different convergence assumptions are used for different companies, explain why this is so.
- c. Explain how the 2002-2003 growth rate is calculated and provide all assumptions and data underlying the calculation.

Answer:

- a. See testimony, page 49, lines 4-8.
- b. The same assumption was used for each company.
- c. As explained in the footnote to Schedules 39 and 40, "the 2003 growth rate is the dividend growth rate achieved from 2002-2003 from Value Line." For example, the 2003 dividend for Cinergy was \$1.84 and the 2002 dividend was \$1.80. The calculation is: (\$1.84/\$1.80-1) * 100=2.22%. The only assumption is that the Value Line data is correct. The data used is:

	2003	2002
Company	Dividend	Dividend
Cinergy	1.84	1.80
DTE	2.06	2.06
FPL	2.40	2.32
MGE	1.35	1.34
Southern	1.39	1.36
Constellation	0.96	1.04
Empire	1.28	1.28
PNM	0.86	0.91
Progress	2.18	2.26

There is an error in the 2003 growth rate for Southern. It should be 2.20%. Attached is a revised Schedule 39 with the corrected growth, dividends, perpetuity value, and IRR.

Exhibit
Carl G. K. Weaver
Revised Schedule 39

Kentucky Utilities Multi-stage DCF Model

Vear Growth Div. Growth <th< th=""><th>•</th><th></th><th>Cinergy Corp.</th><th>σy σ</th><th>DTE</th><th> 2</th><th>FPL</th><th>۽ پ</th><th>Ž</th><th>MGE</th><th>Southern</th><th>em</th></th<>	•		Cinergy Corp.	σy σ	DTE	2	FPL	۽ پ	Ž	MGE	Southern	em
2003 2.22% 1.88 0.00% 2.08 2.48 0.75% 1.37 2.21% 2.005 3.45% 2.48 0.75% 1.37 2.21% 2.005 3.00% 1.99 2.65% 2.11 3.81% 2.58 2.06% 1.40 2.96% 2.005 3.38% 2.05 3.97% 2.25 4.54% 2.81 4.68% 1.51 4.47% 2.009 3.78% 2.21 5.29% 2.49 4.91% 3.09 6.00% 1.50 5.23% 2.010 3.78% 2.21 5.29% 2.49 4.91% 3.09 6.00% 1.70 5.23% 2.01 3.78% 2.47 5.29% 2.91 4.91% 3.09 6.00% 1.91 5.23% 2.01 3.78% 2.57 5.29% 2.91 4.91% 3.40 6.00% 1.91 5.23% 2.01 3.78% 2.57 5.29% 2.91 4.91% 3.40 6.00% 1.91 5.23% 2.01 3.78% 2.57 5.29% 3.00 4.91% 3.40 6.00% 2.15 5.23% 2.01 3.78% 2.01 5.29% 3.00 4.91% 3.40 6.00% 2.15 5.23% 2.01 3.78% 2.07 5.29% 3.00 4.91% 3.93 6.00% 2.15 5.23% 2.01 3.78% 2.01 5.29% 3.00 6.00% 2.15 5.23% 2.01 3.78% 2.01 5.29% 3.00 6.00% 2.15 5.23% 2.01 3.78% 2.01 5.29% 3.00 6.00% 2.15 5.23% 2.01 3.78% 2.01 5.29% 3.00 6.00% 2.15 5.23% 2.01 3.78% 2.01 5.29% 3.00 6.00% 2.15 5.23% 2.01 3.78% 2.01 5.29% 3.00 6.00% 2.15 5.23% 2.01 3.78% 2.01 5.29% 3.00 6.00% 2.15 5.23% 2.01 3.78% 2.01 5.29% 3.00 6.00% 2.15 5.23% 2.01 5.29% 2	Name:	Year	Growth		Growth	DIV.	Growth	3	Growth	y S	d Hoo	any
2003 2.22% 1.88 0.00% 2.08 3.45% 2.48 0.75% 1.36 -64.16 2.004 2.61% 1.93 1.32% 2.22% 1.88 0.00% 2.08 3.45% 2.48 0.75% 1.47 2.21% 2.005 3.38% 2.05 2.25% 2.16 4.18% 2.69 3.37% 1.45 3.72% 2.006 3.38% 2.05 2.25% 2.16 4.18% 2.94 6.00% 1.51 4.47% 2.009 3.78% 2.21 5.29% 2.49 4.91% 3.09 6.00% 1.91 5.23% 2.010 3.78% 2.31 5.29% 2.49 4.91% 3.40 6.00% 1.91 5.23% 2.010 3.78% 2.36 5.29% 2.91 4.91% 3.74 6.00% 2.03 5.23% 2.014 3.78% 2.57 5.29% 3.20 4.91% 3.74 6.00% 2.03 5.23% 2.013 3.78% 2.57 5.29% 3.20 4.91% 3.78 6.00% 2.15 5.23% 2.014 3.78% 2.57 5.29% 3.20 4.91% 3.78 6.00% 2.15 5.29% 2.01 4.91% 3.78 6.00% 2.15 5.23% 2.014 3.78% 2.37 5.29% 3.30 4.91% 3.78 6.00% 2.15 5.23% 2.015 3.78% 2.37 5.29% 3.37 4.91% 4.91% 3.93 6.00% 2.15 5.23% 2.016 3.78% 2.37 5.29% 3.37 4.91% 4.35 6.00% 2.15 5.23% 2.016 3.78% 2.38 5.29% 3.37 4.91% 4.53 6.00% 2.21 5.23% 2.016 3.78% 2.38 5.29% 3.37 4.91% 4.75 6.00% 2.21 5.23% 2.016 3.78% 2.38 5.29% 3.37 4.91% 4.75 6.00% 2.15 5.23% 2.016 3.78% 2.38 5.29% 3.37 4.91% 4.75 6.00% 2.87 5.23% 2.016 3.78% 2.38 5.29% 3.37 4.91% 4.75 6.00% 2.87 5.23% 2.016 3.78% 2.38 5.29% 3.37 4.91% 4.75 6.00% 2.87 5.23% 2.017 3.78% 2.38 5.29% 3.37 4.91% 4.75 6.00% 2.87 5.23% 2.017 3.78% 2.38 5.29% 3.37 4.91% 4.75 6.00% 2.87 5.23% 2.01% 3.78% 2.38 5.29% 3.37 4.91% 4.75 6.00% 2.87 5.23% 2.01% 3.78% 2.38 5.29% 3.37 4.91% 4.75 6.00% 2.87 5.23% 2.01% 3.78% 2.38 5.29% 3.37 4.91% 4.75 6.00% 2.87 5.23% 2.01% 3.78% 2.38 5.29% 3.37 4.91% 4.75 6.00% 2.87 5.23% 2.01% 3.78% 2.09 5.29% 3.37 4.91% 4.75 6.00% 2.87 5.23% 2.01% 3.78% 2.38 5.29% 3.37 4.91% 4.75 6.00% 2.87 5.23% 2.01% 3.78% 2.98 5.29% 3.37 4.91% 4.75 6.00% 2.87 5.23% 2.01% 3.78% 2.98 5.29% 3.00 5.29% 3.00 5.29% 2.01% 2.00% 2.01% 2.00% 2.00% 2.01% 2.00%											GIOWEI	
2003 2.22% 1.86 3.45% -64.16 -31.87 2004 2.61% 1.93 1.32% 2.11 3.81% 2.68 0.75% 1.37 2004 2.61% 1.93 1.32% 2.11 3.81% 2.68 0.75% 1.37 2.21% 2005 3.00% 1.99 2.65% 2.16 4.18% 2.69 3.37% 1.45 2.29% 2006 3.38% 2.05 2.29% 2.25 4.54% 2.81 4.68% 1.51 4.47% 2008 3.78% 2.21 5.29% 2.37 4.91% 3.09 6.00% 1.70 5.23% 2009 3.78% 2.21 5.29% 2.91 4.91% 3.09 6.00% 1.70 5.23% 2010 3.78% 2.38 5.29% 2.91 4.91% 3.24 6.00% 1.91 5.23% 2011 3.78% 2.67 5.29% 2.91 4.91% 3.74 6.00% 1.91 5.23% 2012 3.78% 2.67 5.29% 2.91 4.91% 3.74 6.00% 2.15 5.23% 2013 3.78% 2.87 5.29% 3.40 6.00% 2.15 <td>Current Dividend:</td> <td></td> <td></td> <td>184</td> <td></td> <td>900</td> <td></td> <td>Ş</td> <td></td> <td>•</td> <td></td> <td></td>	Current Dividend:			184		900		Ş		•		
2003 2.22% -36.43 -64.16 -31.87 2004 2.22% -1.88 0.00% 2.08 3.45% 2.48 0.75% 1.37 2.21% 2004 2.61% 1.93 1.32% 2.11 3.81% 2.58 2.06% 1.40 2.96% 2005 3.00% 1.99 2.65% 2.11 3.81% 2.58 2.06% 1.40 2.96% 2006 3.38% 2.05 3.97% 2.25 4.54% 2.81 4.68% 1.51 4.7% 2007 3.78% 2.13 5.29% 2.37 4.91% 2.94 6.00% 1.70 5.29% 2008 3.78% 2.21 5.29% 2.63 4.91% 3.24 6.00% 1.70 5.23% 2010 3.78% 2.47 5.29% 2.91 4.91% 3.40 6.00% 1.91 5.23% 2011 3.78% 2.57 5.29% 2.91 4.91% 3.74 6.00% <td< td=""><td>11/03/03 Stock Price</td><td></td><td></td><td></td><td></td><td>60.2</td><td></td><td>2.40</td><td></td><td>1.36</td><td></td><td>1.39</td></td<>	11/03/03 Stock Price					60.2		2.40		1.36		1.39
2003 2.22% 1.88 0.00% 2.08 3.45% 2.48 0.75% 1.37 2.21% 2004 2.61% 1.93 1.32% 2.11 3.81% 2.58 2.06% 1.40 2.96% 2005 3.00% 1.99 2.65% 2.16 4.18% 2.69 3.37% 1.45 3.72% 2006 3.38% 2.05 3.97% 2.25 4.54% 2.81 4.68% 1.51 4.47% 2008 3.78% 2.13 5.29% 2.37 4.91% 2.94 6.00% 1.70 5.29% 2009 3.78% 2.30 5.29% 2.49 4.91% 3.09 6.00% 1.70 5.29% 2010 3.78% 2.38 5.29% 2.63 4.91% 3.40 6.00% 1.70 5.29% 2011 3.78% 2.57 5.29% 2.91 4.91% 3.40 6.00% 1.70 5.29% 2012 3.78% 2.57 5.29	Defended Division is		,	-30.43		-35.85		-64.16		-31.87		-29 72
2.61% 1.93 1.32% 2.11 3.81% 2.58 2.06% 1.40 2.96% 3.00% 1.99 2.65% 2.16 4.18% 2.69 3.37% 1.45 3.72% 3.00% 1.99 2.65% 2.16 4.18% 2.69 3.37% 1.45 3.72% 3.38% 2.05 3.97% 2.25 4.54% 2.81 4.68% 1.51 4.47% 3.78% 2.13 5.29% 2.37 4.91% 3.09 6.00% 1.70 5.23% 3.78% 2.30 5.29% 2.63 4.91% 3.24 6.00% 1.91 5.23% 3.78% 2.47 5.29% 2.91 4.91% 3.40 6.00% 2.19 5.23% 3.78% 2.57 5.29% 3.06 4.91% 3.74 6.00% 2.15 5.23% 3.78% 2.87 5.29% 3.23 4.91% 4.12 6.00% 2.15 5.23% 3.78% 2.98 5.29% 3.58 4.91% 4.52 6.00% 2.71 5.23%	rojected Dividends:	2003	2.22%	1.88	0.00%	2.08	3.45%	2.48	0 75%	1 37	2 2 4 04	4 45
3.00% 1.99 2.65% 2.16 4.18% 2.69 3.37% 1.45 3.72% 3.38% 2.05 3.97% 2.25 4.54% 2.81 4.68% 1.51 4.47% 3.78% 2.21 5.29% 2.37 4.91% 2.94 6.00% 1.50 5.23% 3.78% 2.30 5.29% 2.49 4.91% 3.09 6.00% 1.70 5.23% 3.78% 2.38 5.29% 2.91 4.91% 3.24 6.00% 1.91 5.23% 3.78% 2.47 5.29% 2.91 4.91% 3.57 6.00% 2.03 5.23% 3.78% 2.57 5.29% 3.06 4.91% 3.57 6.00% 2.03 5.23% 3.78% 2.57 5.29% 3.23 4.91% 3.93 6.00% 2.215 5.23% 3.78% 2.87 5.29% 3.23 4.91% 4.12 6.00% 2.21 5.23% 3.78% 2.87 5.29% 3.58 4.91% 4.32 6.00% 2.21 5.23% 3.78% 2.87 5.29% 3.58 4.91% 4.53 6.00% 2.21 5.23% 5.23% 3.78% 2.98 5.29% 3.77 4.91% 4.53 6.00% 2.87 5.23% 5.23% 6.4.79 80.91 137.08 80.13		2004	2.61%	1.93	1.32%	2.11	3.81%	2.58	2000	5 6	2.600	7
3.38% 2.05 3.97% 2.25 4.54% 2.81 4.68% 1.51 4.47% 3.78% 2.13 5.29% 2.37 4.91% 2.94 6.00% 1.50 5.23% 3.78% 2.21 5.29% 2.37 4.91% 3.09 6.00% 1.70 5.23% 3.78% 2.30 5.29% 2.63 4.91% 3.24 6.00% 1.70 5.23% 3.78% 2.38 5.29% 2.91 4.91% 3.40 6.00% 1.91 5.23% 3.78% 2.57 5.29% 2.91 4.91% 3.74 6.00% 2.15 5.23% 3.78% 2.57 5.29% 3.23 4.91% 3.74 6.00% 2.15 5.23% 3.78% 2.87 5.29% 3.40 4.91% 4.32 6.00% 2.71 5.23% 3.78% 2.87 5.29% 3.77 4.91% 4.76 6.00% 2.71 5.23% 3.78% 2.98 5.29% 3.97 4.91% 4.76 6.00% 2.87 5.23%		2005	3 00%	1.99	2.65%	2.16	4 18%	900	2 2 2 2 2	- 4 - 4 - 1	2.9070	9.4
3.78% 2.13 5.29% 2.37 4.54% 2.81 4.68% 1.51 4.47% 3.78% 2.13 5.29% 2.37 4.91% 2.94 6.00% 1.50 5.23% 3.78% 2.21 5.29% 2.49 4.91% 3.09 6.00% 1.70 5.23% 3.78% 2.38 5.29% 2.76 4.91% 3.24 6.00% 1.91 5.23% 3.78% 2.38 5.29% 2.91 4.91% 3.74 6.00% 2.15 5.23% 3.78% 2.66 5.29% 3.20 4.91% 3.74 6.00% 2.15 5.23% 3.78% 2.87 5.29% 3.40 4.91% 4.12 6.00% 2.41 5.23% 3.78% 2.98 5.29% 3.77 4.91% 4.53 6.00% 2.71 5.23% 3.78% 2.98 5.29% 3.77 4.91% 4.76 6.00% 2.71 5.23% 3.78% 2.98 5.29% 3.97 4.91% 4.76 6.00% 2.71 5.23%		2006	3 38%	, כ ק	2020	i (201	2.03	0.00	T.45	3.72%	1.52
3.0% 2.13 4.91% 2.94 6.00% 1.60 5.23% 3.78% 2.21 5.29% 2.49 4.91% 3.09 6.00% 1.70 5.23% 3.78% 2.30 5.29% 2.63 4.91% 3.24 6.00% 1.91 5.23% 3.78% 2.37 5.29% 2.91 4.91% 3.74 6.00% 2.03 5.23% 3.78% 2.57 5.29% 3.06 4.91% 3.74 6.00% 2.15 5.23% 3.78% 2.66 5.29% 3.23 4.91% 3.93 6.00% 2.15 5.23% 3.78% 2.87 5.29% 3.40 4.91% 4.12 6.00% 2.21 5.23% 3.78% 2.87 5.29% 3.58 4.91% 4.56 6.00% 2.71 5.23% 3.78% 2.98 5.29% 3.77 4.91% 4.56 6.00% 2.71 5.23% 3.78% 3.09 5.29% 3.97 4.91% 4.76 6.00% 2.87 5.23% 64.79		2002	0.00%	, i	0.9770	2.70	4.54%	2.81	4.68%	1.51	4.47%	1.58
3.78% 2.21 5.29% 2.49 4.91% 3.09 6.00% 1.70 5.23% 3.78% 2.30 5.29% 2.63 4.91% 3.24 6.00% 1.70 5.23% 3.78% 2.38 5.29% 2.76 4.91% 3.40 6.00% 1.91 5.23% 3.78% 2.47 5.29% 2.91 4.91% 3.57 6.00% 2.15 5.23% 3.78% 2.57 5.29% 3.06 4.91% 3.74 6.00% 2.15 5.23% 3.78% 2.66 5.29% 3.23 4.91% 4.12 6.00% 2.41 5.23% 3.78% 2.87 5.29% 3.58 4.91% 4.53 6.00% 2.71 5.23% 3.78% 2.98 5.29% 3.97 4.91% 4.76 6.00% 2.87 5.23% 3.78% 3.09 5.29% 3.97 4.91% 4.76 6.00% 2.87 5.23% 44.79 8.5% 4.91% 4.76 6.00% 2.87 5.23% 85% <		7007	3.78%	2.13	5.29%	2.37	4.91%	2.94	6.00%	1.60	5.23%	1.67
3.78% 2.30 5.29% 2.63 4.91% 3.24 6.00% 1.80 5.23% 3.78% 2.38 5.29% 2.76 4.91% 3.40 6.00% 1.91 5.23% 3.78% 2.47 5.29% 2.91 4.91% 3.74 6.00% 2.03 5.23% 3.78% 2.57 5.29% 3.06 4.91% 3.74 6.00% 2.15 5.23% 3.78% 2.77 5.29% 3.40 4.91% 4.12 6.00% 2.24 5.23% 3.78% 2.87 5.29% 3.58 4.91% 4.52 6.00% 2.41 5.23% 3.78% 2.87 5.29% 3.58 4.91% 4.53 6.00% 2.71 5.23% 3.78% 2.98 5.29% 3.77 4.91% 4.53 6.00% 2.71 5.23% 64.79 80.91 10.4% 8.5% 9.8%		2008	3.78%	2.21	5.29%	2.49	4.91%	3.09	800%	1 70	5 23%	7.5
3.78% 2.38 5.29% 2.76 4.91% 3.40 6.00% 1.91 5.23% 3.78% 2.47 5.29% 2.91 4.91% 3.57 6.00% 2.03 5.23% 5.23% 2.57 5.29% 3.06 4.91% 3.74 6.00% 2.15 5.23% 3.78% 2.77 5.29% 3.40 4.91% 4.12 6.00% 2.41 5.23% 3.78% 2.87 5.29% 3.58 4.91% 4.52 6.00% 2.41 5.23% 3.78% 2.87 5.29% 3.58 4.91% 4.53 6.00% 2.71 5.23% 3.78% 3.09 5.29% 3.97 4.91% 4.76 6.00% 2.87 5.23% 64.79 80.91 137.08 8.5% 9.8%		2009	3.78%	2.30	5.29%	2.63	4.91%	3.24	8009	2 6	5 23%	- +
3.78% 2.47 5.29% 2.91 4.91% 3.57 6.00% 2.03 5.23% 3.78% 2.57 5.29% 3.06 4.91% 3.57 6.00% 2.15 5.23% 3.78% 2.57 5.29% 3.23 4.91% 3.74 6.00% 2.15 5.23% 3.78% 2.87 5.29% 3.40 4.91% 4.12 6.00% 2.41 5.23% 3.78% 2.87 5.29% 3.58 4.91% 4.53 6.00% 2.71 5.29% 3.77 4.91% 4.53 6.00% 2.71 5.23% 3.78% 3.09 5.29% 3.97 4.91% 4.76 6.00% 2.87 5.23% 64.79 80.91 137.08 8.5% 9.8%		2010	3.78%	2.38	5.29%	2.76	4.91%	3.40	800.9	5 5	5.23.76	3 5
3.78% 2.57 5.29% 3.06 4.91% 3.74 6.00% 2.15 5.23% 3.78% 2.66 5.29% 3.23 4.91% 3.74 6.00% 2.15 5.23% 5.23% 2.77 5.29% 3.40 4.91% 4.12 6.00% 2.24 5.23% 3.78% 2.87 5.29% 3.58 4.91% 4.53 6.00% 2.71 5.23% 3.78% 2.98 5.29% 3.77 4.91% 4.53 6.00% 2.71 5.23% 2.3% 3.78% 3.09 5.29% 3.97 4.91% 4.76 6.00% 2.87 5.23% 2.87 8.5% 10.4% 8.5% 9.8%		2011	3.78%	2.47	5.29%	2.91	4 91%	3.57	8008	- c	2000	- c
3.78% 2.66 5.29% 3.23 4.91% 3.93 6.00% 2.19 5.23% 3.78% 2.87 5.29% 3.23 4.91% 4.12 6.00% 2.28 5.23% 3.78% 2.87 5.29% 3.58 4.91% 4.53 6.00% 2.71 5.23% 3.78% 3.09 5.29% 3.97 4.91% 4.76 6.00% 2.71 5.23% 2.3% 3.8% 3.8% 3.8% 3.8% 3.8% 3.8% 3.8% 3		2012	3.78%	2.57	5 29%	3.06	70107	77.0	2000	2.03	0.52%	2.U3
3.78% 2.77 5.29% 3.40 4.91% 3.93 6.00% 2.28 5.23% 2.73 8.78% 2.77 5.29% 3.40 4.91% 4.12 6.00% 2.41 5.23% 2.78% 2.87 5.29% 3.58 4.91% 4.53 6.00% 2.71 5.23% 2.3% 2.38% 3.77 4.91% 4.76 6.00% 2.71 5.23% 2.3% 2.3% 2.3% 2.3% 3.78% 3.09 5.29% 3.97 4.91% 4.76 6.00% 2.71 5.23% 2.3% 2.3% 2.3% 2.3% 2.3% 2.3% 2.3%		2013	3 780%	2 6 6	5,02.5	8 6	8 6 6	5.7¢	9.00% 0.00%	2.15	5.23%	2. 15
3.78% 2.77 5.29% 3.40 4.91% 4.12 6.00% 2.41 5.23% 3.78% 2.87 5.29% 3.58 4.91% 4.32 6.00% 2.41 5.23% 2.378% 2.98 5.29% 3.77 4.91% 4.53 6.00% 2.71 5.23% 2.378% 3.09 5.29% 3.97 4.91% 4.76 6.00% 2.87 5.23% 2.87 80.91 137.08 80.13		20.00	0.00	2.00	0.29%	3.23	4.91%	3.93	800.9	2.28	5.23%	2.26
3.78% 2.87 5.29% 3.58 4.91% 4.32 6.00% 2.56 5.23% 3.78% 2.98 5.29% 3.77 4.91% 4.53 6.00% 2.71 5.23% 2.378% 3.09 5.29% 3.97 4.91% 4.76 6.00% 2.87 5.23% 2.64.79 80.91 137.08 80.13		2014	3.78%	2.77	5.29%	3.40	4.91%	4.12	6.00%	2.41	5 23%	238
3.78% 2.98 5.29% 3.77 4.91% 4.53 6.00% 2.71 5.23% 3.78% 3.09 5.29% 3.97 4.91% 4.76 6.00% 2.87 5.23% 2.87 64.79 80.91 137.08 80.13 80.13		2015	3.78%	2.87	5.29%	3.58	4.91%	4.32	8009	2.56	5 23%	ic
3.78% 3.09 5.29% 3.97 4.91% 4.76 6.00% 2.87 5.23% 2 64.79 80.91 137.08 80.13 80.13 8.5% 10.4% 8.5% 9.8%		2016	3.78%	2.98	5.29%	3.77	4 91%	4.53	8008	274	0.207	
8.5% 13.0% 2.87 5.23% 2 64.79 80.91 137.08 80.13 5.23% 2 8.5% 10.4% 8.5% 9.8%		2017	3.78%	3.09	5 29%	3 07	7 040%	32.7	2000	- 10	0.4370	4.04
8.5% t0.4% 8.5% 9.8%	PV of dividend perpetuity	v in 2018		04 40	2	5	8. 6. 7.	0	800.0	78.7	5.23%	2.78
8.5% 10.4% 8.5% 9.8%				9. 9.		80.91		137.08		80.13		66.86
	Internal Rate of Re	eturn:		8.5%		10.4%		8.5%		9.8%		9.6%
	Average Interna	Rate of Ref										

Notes: The Current Dividend is the latest quarterly dividend times 4 from Schedule 34.

The 2003 rate of growth is the dividend growth rate achieved from 2002-2003 from Value Line.

The 2003 rate of growth converges on the 3-5 year growth forcast (the average of the Zacks, Multex, Thomson, and Value Line EPS for each company) in the year 2007 which is 4 years beyond the forecast date.

The formula for determining the PV of perpetual dividends equals [$D_{(rean)}(1+g)/(k-g)$] where k is the iteratively determined IRR and g is the growth rate.

Responses of the Attorney General's Witness Carl G. K. Weaver to Commonwealth of Kentucky PSC Case No. 2003-00334

And Case No. 2003-00335

Louisville Gas and Electric Company's and Kentucky Utilities Company's Initial Requests for Information

Explain what changes in risk have occurred for KU to lead Dr. Weaver to recommend a 50-100 basis point lower cost of equity for KU compared with LG&E when the Commission less than three years ago, determined that both Companies had the same required return.

Answer:

I disagree with the Commission decision that was made three years ago. KU had more equity it its capital structure and this fact alone would cause it to have a lower cost of equity.



Throughout his testimony Dr. Weaver utilizes the equity ratio of 59.6% for KU. Please provide the calculation of the equity ratio using the current methodology of adjusting the capitalization for Environmental Surcharge costs as approved in Case Number 2003-068.

Answer:

The 59.6% equity ratio for KU was taken from page V-10 of the BWG Report, the capital structure dated May 22, 2003. I did not calculate a different capital structure.

27. Why didn't Dr. Weaver utilize the current methodology for adjusting the capitalization for Environmental Surcharge costs for KU?

Answer:

I was planning to prepare a different capital structure with different capital cost rates. However, I did not receive the response to the Attorney General's first data request, questions 9, 10, 11, and 12, until the evening of November 24. The testimony was due to be filed with the Commission on December 1, a Monday. Therefore, I needed to have it available for the Attorney General's Office by Friday morning the 28th. It had to be e-mailed on the evening of the 27th. That allowed three days, the 25th, 26th, and 27th, to incorporate the information from the responses from the Company. This time frame did not allow me to include any capital structure analysis in the testimony.

28. Throughout his testimony Dr. Weaver utilized the equity ratio of 50.26% for LG&E. Please provide the calculation of the equity ratio using the current methodology of adjusting the capitalization for environmental Surcharge costs as approved in Case Number 2003-236.

Answer:

See response to question 26 and question 27.

29. Why didn't Dr. Weaver utilize the current methodology for adjusting the capitalization for Environmental Surcharge costs for LG&E?

Answer:

See the response to question 26 and question 27.

30. On lines 11-12 of page 27 Dr. Weaver states that using cash flows including changes in working capital provides better information for the analysis. Explain why the proceeds from the sale of accounts receivable associated with the accounts receivable securitization program of KU and LG&E should be included in cash flow for operations rather than cash flows from financing if the balances outstanding under the accounts receivable securitization program are considered as debt in determining the capital structure of the companies for purposes fo the ESM.

Answer:

The accounts receivable securitization program, as I understand the program, uses accounts receivable as security or collateral for debt financing. The accounts receivable balance as of the end of the year remains on the balance sheet in current assets. When accounts receivable on the balance sheet increase, funds are tied up because a sale has been made, the cost of the sale has been incurred, and the collection from the sale has not occurred. A decrease in accounts receivable is a source of funds. The accounts receivable themselves are similar to fixed assets that are used to secure 1st mortgage bonds. The change in fixed assets are included in Cash Flow from Investment Activities and if a 1st mortgage bond was issued to obtain funds for financing, the debt financing is included in Cash Flow from Financing Activities.

31. What adjustments, if any did Dr. Weaver make to the capital structure of LG&E and KU to incorporate long-term purchased power obligations that are considered to be debt equivalents by the rating agencies?

Answer:

See response to questions 26 and 27.